PART Y-5
RESPIRATORS

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WAC 296-307-594 Scope. This part applies to all use of respirators at work.

Important:

Before you decide to use respirators, you are required to evaluate respiratory hazards and implement control methods as outlined in WAC 296-307-624 through 296-307-628, Respiratory hazards.

The term "**respiratory hazards**" will be used throughout this part to refer to oxygen deficient conditions and harmful airborne hazards.

WAC 296-307-594 (Cont.)

Definition:

Respirators are a type of personal protective equipment designed to protect the wearer from respiratory hazards.

You can use Table 1 for general guidance on which sections apply to you.

Table 1
Sections that apply to your workplace

If employees...	**Then the sections marked with an "X" apply...**					
	596	598	600	602-618	620	622
Request and are **permitted** to voluntarily use filtering-facepiece respirators, and are not exposed to a respiratory hazard		X				X
Request and are **permitted** to voluntarily use respirators that are **not** filtering-facepiece respirators, and are not exposed to a respiratory hazard	X	X			X	X
Are **required** to use any respirator by WISHA or the employer	X		X	X	X	X
Would use an **escape respirator** in an emergency	X		X	X	X	X

Reference: See WAC 296-307-100, Personal protective equipment (PPE) to find requirements for other types of personal protective equipment (PPE), such as eye, hand, and head protection.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-594, filed 12/21/04, effective 04/02/05.]

WAC 296-307-596 Respirator program administrator.

Your responsibility:

To make sure a capable individual is in charge of respirator program development and management.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-596, filed 12/21/04, effective 04/02/05.]

WAC 296-307-59605 Designate a program administrator.

Exemption: You don't need to designate a program administrator if employees use only filtering-facepiece respirators and do so only as voluntary use.

Definition:

Voluntary use is respirator use that is requested by the employee and permitted by the employer when no respiratory hazard exists.

You must:

- Designate a program administrator who has overall responsibility for your program and has sufficient training or experience to:
  - Oversee program development and coordinate implementation
  - Conduct required evaluations of program effectiveness outlined in WAC 296-307-60005.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-59605, filed 12/21/04, effective 04/02/05.]

WAC 296-307-598 Voluntary respirator use requirements.

Your responsibility:

To make sure voluntary use of respirators by employees doesn't create job safety or health hazards.

You must:

Make sure voluntary use of respirators is safe
WAC 296-307-59805
Keep voluntary use respirator program records
WAC 296-307-59810.

Important:

- Respirator use is **NOT** voluntary if a respiratory hazard, such as exposure to a substance over the permissible exposure limit (PEL) or hazardous exposure to an airborne biological hazard, is present.
- To evaluate respiratory hazards in your workplace, see WAC 296-307-624, Respiratory hazards.
- Some requirements in this section don't apply if only filtering-facepiece respirators are used voluntarily. Some filtering-facepiece respirators are equipped with a sorbent layer for absorbing "nuisance" organic vapors. These can be used for voluntary use, but are not NIOSH certified for protection against hazardous concentrations of organic vapor.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-598, filed 12/21/04, effective 04/02/05.]

WAC 296-307-59805 Make sure voluntary use of respirators is safe.

Definition:

Voluntary use is respirator use that is requested by the employee and permitted by the employer when no respiratory hazard exists.

Important: If you choose to require respirator use, use isn't voluntary and the required use sections of this part apply.

You must:

(1) Make sure voluntary respirator use does **NOT:**

- Interfere with an employee's ability to work safely, such as restricting necessary vision or radio communication
  OR
- Create health hazards.

Note: Examples of health hazards include:

- Skin irritation, dermatitis, or other health effects caused by using a dirty respirator
- Illness created by sharing contaminated respirators
- Health effects caused by use of an unsafe air supply, such as carbon monoxide poisoning.

You must:

(2) Provide all voluntary respirator users with the advisory information in Table 2 at no cost to them.

WAC 296-307-59805 (Cont.)

Note: If you have provided employees with the advisory information required in the previous section, WAC 296-307-598, you don't need to provide the additional information in Table 2 to those employees.

You must:

(3) Develop and maintain a written program that includes the following:

- Medical evaluation provisions as specified in WAC 296-307-604.
- Procedures to properly clean and disinfect respirators, according to WAC 296-307-62015, if they are reused.
- How to properly store respirators, according to WAC 296-307-61010, so that using them doesn't create hazards.
- Procedures to make sure there is a safe air supply, according to WAC 296-307-616, when using air-line respirators and SCBAs.
- Training according to WAC 296-307-608 when necessary to ensure respirator use doesn't create a hazard.

Note:

- Pay for medical evaluations, training, travel related costs, and wages. You don't need to pay for respirators employees use only voluntarily.
- If you have both voluntary and required respirator users, you may choose to treat voluntary users as required users. Doing this exceeds the requirements in this section.

Exemption: If employees use only filtering-facepiece respirators and do so only voluntarily, you don't need to develop and maintain a written program.

WAC 296-307-59805 (Cont.)

Use Table 2 to provide information to employees who voluntarily use any type of respirator.

Table 2

Advisory Information for Employees Who Voluntarily Use Respirators
• Respirators protect against airborne hazards when properly selected and used. WISHA recommends voluntary use of respirators when exposure to substances is below WISHA permissible exposure limits (PELs) because respirators can provide you an additional level of comfort and protection.
• If you choose to voluntarily use a respirator (whether it is provided by you or your employer) be aware that respirators can create hazards for you, the user. You can avoid these hazards if you know how to use your respirator properly and how to keep it clean. Take these steps:
– Read and follow all instructions provided by the manufacturer about use, maintenance (cleaning and care), and warnings regarding the respirator's limitations.
– Choose respirators that have been certified for use to protect against the substance of concern. The National Institute for Occupational Safety and Health (NIOSH) certifies respirators. If a respirator isn't certified by NIOSH, you have no guarantee that it meets minimum design and performance standards for workplace use.
♦ A NIOSH approval label will appear on or in the respirator packaging. It will tell you what protection the respirator provides.
– Keep track of your respirator so you don't mistakenly use someone else's.
– **Do Not** wear your respirator into:
♦Atmospheres containing hazards that your respirator isn't designed to protect against.
For example, a respirator designed to filter dust particles won't protect you against solvent vapor, smoke or oxygen deficiency.
♦ Situations where respirator use is required.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-59805, filed 12/21/04, effective 04/02/05.]

WAC 296-307-59810 Keep voluntary use program records.

Exemption: If employees use only filtering-facepiece respirators voluntarily, you don't need to follow these recordkeeping requirements.

You must:

- Keep copies of:
  - Your current written respirator program
  - Written recommendations from the LHCP
- Allow records required by this section to be examined and copied by affected employees and their representatives.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-59810, filed 12/21/04, effective 04/02/05.]

WAC 296-307-600 Written respirator program and recordkeeping.

Your responsibility:

To develop, implement, and maintain a written program that provides clear instruction for safe and reliable respirator use.

WAC 296-307-600 (Cont.)

You must:

Develop and maintain a written program
WAC 296-307-60005
Keep respirator program records
WAC 296-307-60010.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-600, filed 12/21/04, effective 04/02/05.]

WAC 296-307-60005 Develop and maintain a written program.

Exemption: This section does **NOT** apply to respirator use that is voluntary. See WAC 296-307-59805 for voluntary use program requirements.

You must:

(1) Develop a complete worksite-specific written respiratory protection program that includes the applicable elements listed in Table 3.

Note: Pay for respirators, medical evaluations, fit testing, training, maintenance, travel costs, and wages.

You must:

(2) Keep your program current and effective by evaluating it and making corrections. Do all of the following:

- Make sure procedures and program specifications are followed and appropriate.
- Make sure selected respirators continue to be effective in protecting employees. For example:
  - If changes in work area conditions, level of employee exposure, or employee physical stress have occurred, you need to reevaluate your respirator selection.
- Have supervisors periodically monitor employee respirator use to make sure employees are using them properly.
- Regularly ask employees required to use respirators about their views concerning program effectiveness and whether they have problems with:
  - Respirator fit during use
  - Any effects of respirator use on work performance
  - Respirators being appropriate for the hazards encountered
  - Proper use under current worksite conditions
  - Proper maintenance.

WAC 296-307-60005 (Cont.)

When developing your written program include applicable elements listed in Table 3.

Table 3

Required Elements for Required-Use Respirator Programs
• Selection:
– Procedures for respirator selection
– A list specifying the appropriate respirator for each respiratory hazard in your workplace
– Procedures for issuing the proper type of respirator, if appropriate
• Medical evaluation provisions
• Fit-test provisions and procedures, if tight-fitting respirators are selected
• Training provisions that address:
– Respiratory hazards encountered during:
♦ Routine activities
♦ Infrequent activities, for example, bimonthly cleaning of equipment
♦ Reasonably foreseeable emergencies, for example, rescue, spill response, or escape situations
– Proper use of respirators, for example, how to put on or remove respirators, and use limitations.
Note: You do **NOT** need to repeat training on respiratory hazards if employees have been trained on this in compliance with other rules such as WAC 296-307-550, employer chemical hazard communication.
• Respirator use procedures for:
– Routine activities
– Infrequent activities
– Reasonably foreseeable emergencies
• Maintenance:
– Procedures and schedules for respirator maintenance covering:
♦ Cleaning and disinfecting
♦ Storage
♦ Inspection and repair
♦ When to discard respirators
– A cartridge or canister change schedule if air-purifying respirators are selected for use against gas or vapor contaminants and an end-of-service-life-indicator (ESLI) isn't available. In addition, provide:
♦ The data and other information you relied on to calculate change schedule values (for example, highest contaminant concentration estimates, duration of employee respirator use, expected maximum humidity levels, user breathing rates, and safety factors)
• Procedures to ensure a safe air quantity and quality if atmosphere-supplying respirators (air-line or SCBA) are selected
• Procedures for evaluating program effectiveness on a regular basis

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-60005, filed 12/21/04, effective 04/02/05.]

WAC 296-307-60010 Keep respirator program records.

You must:

- Keep the following records:
  - Your current respirator program
  - Each employee's current fit test record, if fit testing is conducted. Fit test records must include:

WAC 296-307-60010 (Cont.)

- ♦ Employee name
- ♦ Test date
- ♦ Type of fit-test performed
- ♦ Description (type, manufacturer, model, style, and size) of the respirator tested
- ♦ Results of fit tests, for example, for quantitative fit tests include the overall fit factor and a print out, or other recording of the test.

- Training records that include employee's names and the dates trained
- Written recommendations from the LHCP.

- Allow records required by this section to be examined and copied by affected employees and their representatives.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-60010, filed 12/21/04, effective 04/02/05.]

WAC 296-307-602 Respirator selection.

Your responsibility:

To select and provide respirators that are appropriate for the hazard, user, and worksite conditions.

Exemption: This section does **NOT** apply to voluntary respirator use. See WAC 296-307-598 of this part for voluntary use program requirements.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-602, filed 12/21/04, effective 04/02/05.]

WAC 296-307-60205 Select and provide appropriate respirators.

Important:

See WAC 296-307-624, Respiratory hazards, for:

- Hazard evaluation requirements. Evaluation results are necessary for respirator selection.
- A list of substance-specific rules that may also apply to you. Those listed rules have additional respirator selection requirements.

You must:

- Select and provide, at no cost to employees, appropriate respirators for routine use, infrequent use, and reasonably foreseeable emergencies (such as escape, emergency, and spill response situations) by completing the following process:

Respirator Selection Process

Step 1: If your only respirator use is for escape, skip to Step 8 to select appropriate respirators.

Step 2: If the respiratory hazard is a biological aerosol, such as TB (tuberculosis), anthrax, psittacosis (parrot fever), or hanta virus, select a respirator appropriate for nonemergency activities recognized to present a health risk to workers and skip to **Step 8**.

- If respirator use will occur during **emergencies**, skip to **Step 8** and document the analysis used to select the appropriate respirator.
- Use Centers for Disease Control (CDC) selection guidance for exposures to specific biological agents when this guidance exists. Visit http://www.cdc.gov.

WAC 296-307-60205 (Cont.)

Step 3: If the respiratory hazard is a pesticide, follow the respirator specification on the pesticide label and skip to **Step 9**.

Step 4: Determine the expected exposure concentration for each respiratory hazard of concern. Use the results from the evaluation required by WAC 296-307-624, Respiratory hazards.

Step 5: Determine if the respiratory hazard is classified as IDLH; if it isn't IDLH skip to **Step 7**.

- The respiratory hazard **IS** classified as IDLH if:
  - The atmosphere is oxygen deficient or oxygen enriched
    OR
  - You **CANNOT** measure or estimate your expected exposure concentration
    OR
  - Your measured or estimated expected exposure concentration is greater or equal to the IDLH value in the NIOSH Pocket Guide to Chemical Hazards

Note:

- WISHA uses the IDLH values in the 1990 edition of the NIOSH Pocket Guide to Hazardous Chemicals to determine the existence of IDLH conditions. You may use more recent editions of this guide. Visit www.cdc.gov/niosh for more information.
- If your measured or estimated expected exposure concentration is below NIOSH's IDLH values, proceed to **Step 7**.

Step 6: Select an appropriate respirator from one of the following respirators for IDLH conditions and skip to **Step 8**:

- Full-facepiece, pressure demand, self-contained breathing apparatus (SCBA) certified by NIOSH for a minimum service life of thirty minutes
  OR
- Full-facepiece, pressure demand air-line respirator equipped with an auxiliary self-contained air supply

Exception: If the respiratory hazard is oxygen deficiency and you can show oxygen concentrations can be controlled within the ranges listed in Table 4 under **ALL** foreseeable conditions, you are allowed to select **ANY** type of SCBA or air-line respirator.

Table 4
Concentration Ranges for Oxygen Deficiency

Altitude (as ft. above sea level)	**Oxygen Concentration Range** (as percent oxygen)
Below 3,001	16.0 - 19.5
3,001 - 4,000	16.4 - 19.5
4,001 - 5,000	17.1 - 19.5
5,001 - 6,000	17.8 - 19.5
6,001 - 8,000	19.3 - 19.5
Above 8,000 feet the exception doesn't apply.	

WAC 296-307-60205 (Cont.)

Step 7: Identify respirator types with assigned protection factors (APFs) from Table 5 that are appropriate to protect employees from the expected exposure concentration.

Step 8: Consider hazards that could require selection of specific respirator types. For example, select full-facepiece respirators to prevent eye irritation or abrasive blasting helmets to provide particle rebound protection.

Step 9: Evaluate user and workplace factors that might compromise respirator performance, reliability or safety.

- If the respiratory hazard is a pesticide, follow the requirements on the pesticide label and skip to **Step 11**.

Examples:

- High humidity or temperature extremes in the workplace.
- Necessary voice communication.
- High traffic areas and moving machinery.
- Time or distance for escape.

Step 10: Follow Table 6 requirements to select an air-purifying respirator.

- If Table 6 requirements can't be met, you must select an air-line respirator or an SCBA.

Step 11: Make sure respirators you select are certified by the National Institute for Occupational Safety and Health (NIOSH).

- To maintain certification, make sure the respirator is used according to cautions and limitations specified on the NIOSH approval label.

Note: While selecting respirators, you will need to select a sufficient number of types, models or sizes to provide for fit testing. You can also consider other respirator use issues, such as accommodating facial hair with a loose fitting respirator.

WAC 296-307-60205 (Cont.)

Use Table 5 to identify the assigned protection factor for different types of respirators

Table 5
Assigned Protection Factors (APF) for Respirator Types

If the respirator is a(n) . . .	Then the APF is . . .
Air-purifying respirator with a:	
• Half-facepiece	10
• Full-facepiece	100
Note: Half-facepiece includes 1/4 masks, filtering facepieces, and elastomeric facepieces.	
Powered air-purifying respirator (PAPR) with a:	
• Loose-fitting facepiece	25
• Half-facepiece	50
• Full-facepiece, equipped with HEPA filters, chemical cartridges or canisters	1000
• Hood or helmet, equipped with HEPA filters, chemical cartridges or canisters	1000
Air-line respirator with a:	
• Half-facepiece and designed to operate in demand mode	10
• Loose-fitting facepiece and designed to operate in continuous flow mode	25
• Half-facepiece and designed to operate in continuous-flow, or pressure-demand mode	50
• Full-facepiece and designed to operate in demand mode	100
• Full-facepiece and designed to operate in continuous-flow or pressure-demand mode	1000
• Helmet or hood and designed to operate in continuous-flow mode	1000
Self-contained breathing apparatus (SCBA) with a tight fitting:	
• Half-facepiece and designed to operate in demand mode	10
• Full-facepiece and designed to operate in demand mode	100
• Full-facepiece and designed to operate in pressure-demand mode	10,000
Combination respirators:	
• Find the APF for each type of respirator in the combination.	The lowest value
• Use the lower APF to represent the combination.	

WAC 296-307-60205 (Cont.)

Use Table 6 to select air-purifying respirators for particle, vapor, or gas contaminants.

Table 6
Requirements for Selecting Any Air-purifying Respirator

If the contaminant is a . . .	Then . . .
• Gas or vapor	• Provide a respirator with canisters or cartridges equipped with a NIOSH-certified, end-of-service-life indicator (ESLI) **OR** • If a canister or cartridge with an ESLI isn't available, develop a cartridge change schedule to make sure the canisters or cartridges are replaced before they are no longer effective **OR** • Select an atmosphere-supplying respirator
• Particle, such as a dust, spray, mist, fog, fume, or aerosol	• Select respirators with filters certified to be at least 95% efficient by NIOSH – For example, N95s, R99s, P100s, or High Efficiency Particulate Air filters (HEPA) **OR** • You may select respirators NIOSH certified as "dust and mist," "dust, fume, or mist," or "pesticides." You can only use these respirators if particles primarily have a mass median aerodynamic diameter of at least two micrometers. *Note*: These respirators are no longer sold for occupational use.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-60205, filed 12/21/04, effective 04/02/05.]

WAC 296-307-604 Medical evaluations.

Your responsibility:

To make sure a respirator used under your specific worksite conditions isn't a health risk to employees.

Exemption: This section does **NOT** apply to employees who **only** use:

- Filtering-facepiece respirators voluntarily. See WAC 296-307-598 of this part for voluntary use requirements
  OR
- Escape-only respirators that are mouthpiece, loose-fitting, or hooded respirators.

Important:

- Using a respirator can create physical risks for an employee each time it is worn. The extent of these risks depends on these factors:

  - Type of respirator
  - Environmental conditions at the worksite
  - Physical demands of the work
  - Use of other protective clothing
  - Employee's health status.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-604, filed 12/21/04, effective 04/02/05.]

WAC 296-307-60405 Provide medical evaluations.

Important:

If you have provided an employee with a medical evaluation addressing respirator use, as required by another chapter, that evaluation will meet the requirements of this section.

You must:

- Follow the medical evaluation process, Steps 1 through 7 in this section, to provide medical evaluations for employees at no cost to them.

Medical Evaluation Process

Step 1: Identify employees who need medical evaluations and determine the frequency of evaluations from Table 7. Include employees who:

- Are required to use respirators
  OR
- Voluntarily use respirators that are not filtering-facepiece respirators

Note: You may use a previous employer's medical evaluation for an employee if you can:

- Show the employee's previous work and use conditions were substantially similar to yours
  AND
- Obtain a copy of the licensed healthcare professional's (LHCP's) written recommendation approving the employee's use of the respirator chosen by you.

WAC 296-307-60405 (Cont.)

Step 2: Identify a licensed healthcare professional (LHCP) to perform your medical evaluations.

Note: If you select a different LHCP, you don't need to have new medical evaluations done.

Step 3: Make sure your LHCP has the following information before the evaluation is completed:

- Information describing the respirators employees may use, including the weight and type.
- How the respirators will be used, including:
  - How often the respirator will be used, for example, daily, or once a month
  - The duration of respirator use, for example, a minimum of one hour, or up to twelve hours
  - The employee's expected physical work effort
  - Additional personal protective clothing and equipment to be worn
  - Temperature and humidity extremes expected during use
- A copy of your written respiratory protection program **and** this part.

Note:

- You may choose to send the questionnaire to the LHCP ahead of time, giving time to review it and add any necessary questions
- The LHCP determines what questions to add to the questionnaire, if any; however, questions in Parts 1-3 may not be deleted or substantially altered.

Step 4: Administer the medical questionnaire in WAC 296-307-61605 to employees, or provide them a medical exam that obtains the same information.

Note: You may use on-line questionnaires if the questions are the same and requirements of this section are met.

- Administer the examination or questionnaire at no cost to employees:
  - During the employee's normal working hours
    OR
  - At a time and place convenient to the employee
- Maintain employee confidentiality during examination or questionnaire administration:
  - Do **not** view employee's answers on the questionnaire
  - Do **not** act in a manner that may be considered a breach of confidentiality

Note: Providing confidentiality is important for securing successful medical evaluations. It helps make sure the LHCP gets complete and dependable answers on the questionnaire.

- Make sure employees understand the content of the questionnaire.
- Provide the employee with an opportunity to discuss the questionnaire or exam results with the LHCP.

WAC 296-307-60405 (Cont.)

Step 5: Provide follow-up evaluation for employees when:

- The LHCP needs more information to make a final recommendation
  OR
- An employee gives any positive response to questions 1-8 in Part 2 or to questions 1-6 in Part 3 of the WISHA medical evaluation questionnaire in WAC 296-307-61605.

Note: Follow-up may include:

- Employee consultation with the LHCP such as a telephone conversation to evaluate positive questionnaire responses
- Medical exams
- Medical tests or other diagnostic procedures.

Step 6: Obtain a written recommendation from the LHCP that contains only the following medical information:

- Whether or not the employee is medically able to use the respirator
- Any limitations of respirator use for the employee
- What future medical evaluations, if any, are needed
- A statement that the employee has been provided a copy of the written recommendation.

Step 7: Provide a powered, air-purifying respirator (PAPR) when the LHCP determines the employee should not wear a negative-pressure air-purifying respirator **AND** is able to wear a PAPR.

Reference: See WAC 296-307-602 for requirements regarding selection of air-purifying respirators.

Note:

- You may discontinue medical evaluations for an employee when the employee no longer uses a respirator.
- If you have staff conducting your medical evaluations, they may keep completed questionnaires and findings as confidential medical records, if they are maintained separately from other records.

WAC 296-307-60405 (Cont.)

Use Table 7 to determine medical evaluation frequency.

Table 7
Evaluation Frequency

Type of Evaluation:	When required:
Initial medical evaluations	• Before respirators are fit-tested or used in the workplace.
Subsequent medical evaluations	• If any of these occur:
	– Your licensed healthcare professional (LHCP) recommends them; for example, periodic evaluations at specified intervals.
	– A respirator program administrator or supervisor informs you that an employee needs reevaluation.
	– Medical signs or symptoms (such as breathing difficulties) are:
	♦ Observed during fit-testing or program evaluation
	OR
	♦ Reported by the employee
	– Changes in worksite conditions such as physical work effort, personal protective clothing, or temperature that could substantially increase the employee's physiological stress.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-60405, filed 12/21/04, effective 04/02/05.]

WAC 296-307-606 Fit testing.

Your responsibility:

To make sure negative and positive-pressure tight-fitting respirators can provide an adequate fit and acceptable level of comfort to employees.

Exemption: This section does **NOT** apply to any respirators that are:

- Voluntarily used. See WAC 296-307-598 for voluntary use requirements.
- Mouthpiece respirators.

Important:

- Fit testing is an activity where the seal of a respirator is tested to determine if it is adequate.
- This section covers general **requirements** for fit testing. Fit-testing **procedures** are covered in WAC 296-307-62010 of this part.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-606, filed 12/21/04, effective 04/02/05.]

WAC 296-307-60605 Conduct fit testing.

You must:

- Provide, at no cost to the employee, fit tests for all tight fitting respirators on the following schedule:
  - Before employees are assigned duties that may require the use of respirators
  - At least every twelve months after initial testing
  - Whenever any of the following occurs:
    - ♦ A different respirator facepiece is chosen such as a different type, model, style, or size
    - ♦ You become aware of a physical change in an employee that could affect respirator fit. For example, you may observe, or be told about, facial scarring, dental changes, cosmetic surgery, or obvious weight changes
    - ♦ An employee notifies you, or your LHCP, that the respirator fit is unacceptable. During the retest, you must give an employee reasonable opportunity to select a different respirator facepiece (size, model, etc.).

Note: You may accept a fit test completed by a previous employer **IF**:

- You obtain written documentation of the fit test
  AND
- The results of the fit test are not more than twelve months old
  AND
- The employee will use the same respirator (the same type, model, style, and size)
  AND
- The fit test was conducted in a way that meets the requirements of WAC 296-307-606 and 296-307-62010.

You must:

- Select an appropriate fit-testing procedure from WAC 296-307-62010 of this part **AND**:
  - Use quantitative fit-test methods when a negative pressure respirator will be used in concentrations requiring a protection factor greater than 10. This includes:
    - ♦ Full facepiece air-purifying respirators
    - ♦ SCBAs operated in demand (negative pressure) mode
    - ♦ Air-line respirators operated in demand mode.
  - Make sure PAPRs, SCBAs, or air-line respirators are fit tested in negative-pressure mode.
- Make sure the person conducting fit testing is able to do all of the following:
  - Prepare test solutions if required
  - Make sure equipment works properly
  - Perform tests properly
  - Recognize invalid tests
  - Calculate fit factors properly if required.

WAC 296-307-60605 (Cont.)

Note:

- No specific training program or certification is required for those who conduct fit tests.
- You should consider evaluating these individuals to determine their proficiency in the fit-testing method to be used.
- You can use an evaluation form such as the form included in the American National Standard for Respirator Fit Testing Methods, ANSI/AIHA Z88.10-2001 to determine if the individual meets these requirements. Visit www.ansi.org or www.aiha.org.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-60605, filed 12/21/04, effective 04/02/05.]

WAC 296-307-608 Training.

Your responsibility:

To make sure employees who are required to use respirators understand and can demonstrate proper respirator use and maintenance.

Important:

This section applies to employees who voluntarily use respirators only when training is necessary to prevent the respirator from creating a hazard. See WAC 296-307-598 for voluntary use requirements.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-608, filed 12/21/04, effective 04/02/05.]

WAC 296-307-60805 Provide effective training.

You must:

- Train employees, based on their duties, if they do any of the following:
  - Use respirators
  - Supervise respirator users
  - Issue, repair, or adjust respirators
- Present effective training in a way that employees understand.

Note:

- Training may be provided using audiovisuals, slide presentations, formal classroom instruction, informal discussions during safety meetings, training programs conducted by outside sources, or a combination of these methods.
- You may want to have instructors available when using video or automated training methods to:
  - Encourage and provide responses to questions for the benefit of employees
  - Evaluate employees' understanding of the material
  - Provide other instructional interaction to employees.

You must:

- Make sure a qualified instructor provides training
- Provide training, at no cost to the employee, at these times:

WAC 296-307-60805 (Cont.)

- Initially, before worksite respirator use begins
- Periodically, within twelve months of the previous training
- Additionally, when the following occur:

  - ♦ The employee hasn't retained knowledge or skills
    OR
  - ♦ Changes in the worksite, or type of respirator make previous training incomplete or obsolete.

Note:

- You may accept an employee's previous training, such as training provided by another employer, to satisfy the initial training requirement if:

  - You can demonstrate the employee received training within the past twelve months
    AND
  - The employee can demonstrate the knowledge and skills to use required respirators effectively.

- If you accept an employee's previous training to satisfy the initial training requirement, you are still responsible for providing periodic, and additional training when needed. Periodic training would need to be provided within twelve months of the employee's previous training.

You must:

- Make sure employees can demonstrate the following knowledge and skills as required by their duties:

  - Why the respirator is necessary. Include, for example, information identifying respiratory hazards such as hazardous chemicals, the extent of the employee's exposure, and potential health effects and symptoms
  - The respirator's capabilities and limitations. Include, for example, how the respirator provides protection and why air-purifying respirators can't be used in oxygen-deficient conditions
  - How improper fit, use, or maintenance can compromise the respirator's effectiveness and reliability
  - How to properly inspect, put on, seal check, use, and remove the respirator
  - How to clean, disinfect, repair, and store the respirator, or how to get this done by someone else
  - How to use the respirator effectively in emergency situations; including what to do when a respirator fails and where emergency respirators are stored
  - Medical signs and symptoms that may limit or prevent the effective use of respirators such as shortness of breath or dizziness
  - The employer's general obligations under this part. For example, developing a written program, selecting appropriate respirators, and providing medical evaluations.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-60805, filed 12/21/04, effective 04/02/05.]

WAC 296-307-610 Maintenance.

Your responsibility:

To make sure respirators are maintained so they will function properly and not create health hazards such as skin irritation.

You must:

Maintain respirators in a clean and reliable condition
WAC 296-307-61005
Store respirators properly
WAC 296-307-61010
Inspect and repair respirators
WAC 296-307-61015

Important:

This section applies to employees who voluntarily use respirators only when maintenance is necessary to prevent the respirator from creating a hazard. See WAC 296-307-598 for voluntary use requirements.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-610, filed 12/21/04, effective 04/02/05.]

WAC 296-307-61005 Maintain respirators in a clean and reliable condition.

You must:

- Make sure respirators are kept, at no cost to the employee, clean, sanitary and in good working order. Do at least the following:

  - Clean and disinfect respirators as often as specified in Table 8 of this section.

Note:

- Use required cleaning and disinfecting procedures in WAC 296-307-62015, or the manufacturer's procedures that:

  - Result in a clean and sanitary respirator
  - Do not damage the respirator
  - Do not harm the user

- Automated cleaning and disinfecting are permitted
- Cleaning and disinfecting may be done by a central facility as long as you make sure respirators provided are clean, sanitary, and function properly.

You must:

- Make sure respirators are assembled properly after cleaning or disinfecting.

WAC 296-307-61005 (Cont.)

Use Table 8 to determine how often to clean and disinfect respirators.

Table 8
Required Frequencies for Cleaning and Disinfecting Respirators

If, the respirator will be . . .	Then, clean and disinfect the respirator . . .
• **Used exclusively** by one employee	• As often as needed to: – Keep it clean and functional **AND** – To prevent health hazards such as skin irritation
• Shared for nonemergency use **OR** • Used for fit-testing or training	• **Before** it is worn by another employee
• Shared for emergency use	• **After** each use so the respirator is immediately ready for use at all times

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-60105, filed 12/21/04, effective 04/02/05.]

WAC 296-307-61010 Store respirators properly.

You must:

- Store respirators to protect them from **ALL** of the following:
  - Deformation of the facepiece or exhalation valve
  - Sunlight or extreme temperatures or other conditions
  - Contamination such as dust or damaging chemicals
  - Excessive moisture.

Note: Use coffee cans, sealable plastic bags, or other suitable means of protection.

You must:

- Follow these additional requirements for emergency respirators:
  - Keep respirators accessible to the work area
  - Store respirators in compartments or with covers clearly marked as containing emergency respirators
  - Follow additional storage instructions from the respirator manufacturer
  - Store an adequate number of emergency respirators in each area where they may be needed.

Note: Emergency respirators include mouthpiece respirators and other respirators that are limited to escape-only use by their NIOSH certification.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-61010, filed 12/21/04, effective 04/02/05.]

WAC 296-307-61015 Inspect and repair respirators.

You must:

- Conduct respirator inspections as often as specified in Table 9.
- Make sure respirator inspections cover **all** of the following:

  - Respirator function
  - Tightness of connections
  - The condition of the facepiece, head straps, valves, connecting tubes, and cartridge, canisters or filters
  - Pliability and deterioration of elastomeric parts
  - Maintenance of air or oxygen cylinders
  - Making sure SCBA air cylinders are at ninety percent of the manufacturer's recommended pressure level
  - Proper functioning of SCBA regulators when air-flow is activated
  - Proper functioning of SCBA low-pressure warning devices when activated

- Certify inspections for emergency respirators by documenting the following:

  - Inspection date
  - Serial number of each respirator or other identifying information
  - Inspector's name or signature
  - Inspection findings
  - Required action, if problems are found.

Note:

- When documenting inspections you may either:

  - Provide the information on a tag or label and attach it to the respirator compartment **OR**
  - Include the information in an inspection report stored in paper or electronic files accessible to employees.

You must:

- Repair or replace any respirator that isn't functioning properly **before** the employee returns to a situation where respirators are required.

  - If respirators fail inspection or are not functioning properly during use due to problems such as leakage, vapor or gas breakthrough, or increased breathing resistance, all of the following apply:

    - ♦ Do **NOT** permit such respirators to be used until properly repaired or adjusted
    - ♦ Use only NIOSH-certified parts
    - ♦ Make sure repairs and adjustments are made by appropriately trained individuals

  - Use the manufacturer or a technician trained by the manufacturer to repair or adjust reducing and admission valves, regulators, and warning devices on SCBAs or air-line respirators.

    - ♦ Follow the manufacturer's recommendations and specifications for the type and extent of repairs.

WAC 296-307-61015 (Cont.)

Use Table 9 to determine how often to inspect respirators.

Table 9
Required Frequencies for Respirator Inspections

If the respirator is . . .	Then inspect . . .
A SCBA in any use	• Before **each** use
	AND
	• During cleaning
	OR
	• Monthly if **NOT** used
Used for nonemergencies, including day-to-day or infrequent use	• Inspect before each use **AND** • During cleaning
Used only for emergencies	• Check for proper function before **and** after **each** use
	AND
	• Inspect at least monthly as instructed by the manufacturer
Used for escape-only purposes	• Before carrying into a work place for use

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-61015, filed 12/21/04, effective 04/02/05.]

WAC 296-307-612 Safe use and removal of respirators.

Your responsibility:

To make sure respirator use and removal is safe.

Exemption: These sections do **NOT** apply to employees who voluntarily use any type of respirator. See WAC 296-307-598 for voluntary use requirements.

You must:

Prevent sealing problems with tight-fitting respirators
WAC 296-307-61205
Make sure employees leave the use area before removing respirators
WAC 296-307-61210.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-612, filed 12/21/04, effective 04/02/05.]

WAC 296-307-61205 Prevent sealing problems with tight-fitting respirators.

You must:

- Make sure employees use the procedure in WAC 296-307-62020 to perform a user seal check each time they put on their tight-fitting respirator.
- Make sure you do **NOT** permit respirator use if employees have a characteristic that interferes with the respirator facepiece seal or valve function. For example, stubble, moustaches, sideburns, bangs, hairlines, or scars between the face and the sealing surface of the respirator will affect the seal.
- Make sure corrective glasses or personal protective equipment (PPE) do **NOT** interfere with the facepiece seal. Examples of PPE include safety glasses, goggles, faceshields, clothing, and hard hats.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-61205, filed 12/21/04, effective 04/02/05.]

WAC 296-307-61210 Make sure employees leave the use area before removing respirators.

You must:

- Make sure employees leave the use area for **any** of these reasons:
  - To replace air-purifying filters, cartridges, or canisters
  - When they smell or taste (detect) vapor or gas leakage from, for example, cartridges, canister, or the facepiece seal
  - When they detect changes in breathing resistance
  - To readjust their respirators
  - To wash their faces and respirators as necessary to prevent skin or eye irritation
  - If they become ill
  - If they experience sensations of dizziness, nausea, weakness, breathing difficulty, coughing, sneezing, vomiting, fever, or chills.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-61210, filed 12/21/04, effective 04/02/05.]

WAC 296-307-614 Standby requirements for immediately dangerous to life or health (IDLH) conditions.

Your responsibility:

To provide adequate assistance to employees using respirators in conditions immediately dangerous to life or health (IDLH).

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-614, filed 12/21/04, effective 04/02/05.]

WAC 296-307-61405 Provide standby assistance in immediately dangerous to life or health (IDLH) conditions.

Important:

WISHA currently uses the IDLH values in the 1990 *NIOSH Pocket Guide to Chemical Hazards* to determine the existence of IDLH conditions. You may use more recent editions of this guide. Visit www.cdc.gov/niosh for more information.

You must:

- Provide at least two standby employees outside the IDLH area.

WAC 296-307-61405 (Cont.)

Note: You need only one standby employee if the IDLH condition is well characterized, will remain stable and you can show one employee can adequately do all of the following:

- Monitor employees in the IDLH area
- Implement communication
- Initiate rescue duties.

- Train and equip standby employees to provide effective emergency rescue. Equip them with:

  - A pressure-demand SCBA or a pressure-demand air-line respirator with an auxiliary SCBA, for each standby employee
  - Appropriate retrieval equipment, when it would help with the effective rescue of the entrant, or an equivalent means of rescue

- Make sure standby employees maintain visual, voice, or signal line communication with employees in the IDLH area
- Make sure that in the event of an emergency:

  - Standby employees notify you or your designee before they enter the IDLH area to - provide emergency rescue
  - You provide necessary assistance when notified.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-61405, filed 12/21/04, effective 04/02/05.]

WAC 296-307-616 Air quality for self-contained breathing apparatus (SCBA) and air-line respirators.

Your responsibility:

To provide employees who use SCBAs or air-line respirators with an acceptable air supply.

You must:

Make sure breathing air and oxygen meet established specifications
WAC 296-307-61605
Prevent conditions that could create a hazardous breathing air supply
WAC 296-307-61610
Make sure compressors don't create a hazardous breathing air supply
WAC 296-307-61615.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-616, filed 12/21/04, effective 04/02/05.]

WAC 296-307-61605 Make sure breathing air and oxygen meet established specifications.

You must:

- Make sure that all SCBAs and air-line respirators are provided with safe breathing air and oxygen according to the following:

  - Compressed breathing air must meet the following specifications for Grade D air:

    - ♦ Oxygen (volume/volume) within 19.5-23.5%
    - ♦ Hydrocarbon (condensed): no more than five milligrams per cubic meter of air
    - ♦ Carbon **monoxide** (CO): no more than ten parts per million (ppm)
    - ♦ Carbon **dioxide** (CO2): no more than 1,000 ppm
    - ♦ No noticeable odor

Reference: See the American National Standards Institute - Compressed Gas Association Commodity Specification for Air (G-7.1.1989) for more information. Contact your local library to access a copy.

You must:

- Make sure the moisture content of the air supplied meets the following:

  - Air supplied to respirators from cylinders must **NOT** exceed a dew point of -50°F (or -45.6°C) at 1 atmospheric pressure.
  - Compressor supplied air must not exceed a dew point of 10°F (or 5.56°C) **BELOW** the use temperature at 1 atmospheric pressure.

- Cylinders obtained from a supplier of breathing air must have a certificate of analysis that verifies each cylinder's contents meet Grade D and dew point standards.
- Compressed and liquid oxygen must meet the United States Pharmacopoeia requirements for medical or breathing oxygen.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-61605, filed 12/21/04, effective 04/02/05.]

WAC 296-307-61610 Prevent conditions that could create a hazardous breathing air supply.

You must:

- Use SCBA and air-line respirators safely:

  - Do not supply compressed oxygen to SCBAs or air-line respirators that previously used compressed air.

Note: Compressed air leaves residues containing hydrocarbons such as oil or grease. Fire or explosion can occur if compressed oxygen makes contact with these residues.

You must:

- Use breathing air couplings on air-line respirators that are **NOT** compatible with couplings for nonrespirable air or other gas systems, for example, utility air used for manufacturing purposes.
- Do **NOT** allow asphyxiating substances to enter breathing air lines; for example, don't flush nitrogen through worksite air lines also used for breathing air.
- Use equipment specifically designed for oxygen service or distribution **IF** oxygen concentrations greater than 23.5% are used.

WAC 296-307-61610 (Cont.)

Note: Respiratory equipment **NOT** designed for oxygen service or distribution can create fire or explosion hazards in oxygen concentrations higher than 23.5%.

You must:

- Make sure cylinders used to supply breathing air for SCBAs or air-line respirators are tested and maintained as described in the federal Department of Transportation's (DOT) Shipping Container Specification Regulations, Title 49 CFR Parts 173 and 178.

Note:

- Use only cylinders marked (with serial number, cylinder pressure, DOT exemption number, and test dates) according to these DOT regulations
- To find any Code of Federal Regulations (CFR) visit: www.access.gpo.gov.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-61610, filed 12/21/04, effective 04/02/05.]

WAC 296-307-61615 Make sure compressors do not create a hazardous breathing air supply.

Important:

- Ambient-air movers (or pumps) used to supply air to respirators must be used according to the manufacturer's instructions.
- Respirators used with ambient-air movers must be approved by NIOSH to operate within the pressure ranges of the air mover.

You must:

(1) Locate or modify compressor intakes so they won't pick up contaminated air or exhaust gases such as carbon monoxide from:

- Fuel-powered vehicles
  OR
- The internal combustion motor of the compressor
  OR
- Other contaminant sources in the area, for example, a ventilation system discharge.

Note:

- You may need to reposition or extend the compressor's intake or engine exhaust pipe or outlet, especially if they are located near each other.
- Be aware that exhaust gases may not adequately disperse when the compressor is operated in:
  - An enclosed space such as a small room, a corner, or near a wall
    OR
  - In turbulent wind conditions.

You must:

(2) Equip compressors with suitable air-purifying filters, water traps, and sorbents (such as charcoal beds) and maintain them as follows:

WAC 296-307-61615 (Cont.)

- Periodically change or clean them according to the manufacturer or supplier's instructions
- Keep a tag at the compressor with the following information:

  - When the sorbent and filters were last replaced or cleaned
  - The date of the most recent changes or cleaning
  - The signature of the person authorized by the employer to perform changes or cleaning.

Note: To be sure you are providing the recommended operating pressure for respirators, you may need to install a delivery pressure gauge at the point where the manifold respirator hose is attached.

You must:

(3) Make sure the carbon monoxide (CO) level in breathing air from compressors does **NOT** exceed ten parts per million (ppm).

Note: If you don't have a reliable CO-free area available for locating your compressor intake, consider these examples of methods to prevent CO contamination of the air supply:

- Use of continuous and effective carbon monoxide alarms and filters
- Conduct frequent monitoring of air quality
- Use a CO converter (converts CO to carbon dioxide).

You must:

- Maintain CO levels in oil lubricated compressors by using at least one of the following:

  - An effective CO alarm
  - An effective high temperature alarm **AND** testing the air supply often enough to see if CO levels exceed ten ppm.

Note:

- How often to test depends on a number of considerations, for example:

  - Compressor age
  - Maintenance history of the compressor
  - Stability of CO readings

- If the CO or high temperature alarm can't be heard by the employee, a flashing light or other effective alternative to an audio alarm needs to be used
- Safeguards, such as alarms, are necessary to prevent CO contamination resulting from compressor overheating
- Any type of oil-lubricated compressor, such as screw or piston types, may produce dangerous levels of CO if overheating occurs

  - Old compressors are known to leak oil due to worn parts, increasing the possibility for overheating. Newer compressors may also overheat if maintenance practices are poor. For example, poor maintenance practices may lead to disconnected or incorrectly set alarms, inoperative shut-offs, or an impaired cooling system

- You need to instruct employees to move to a safe area when the alarm sounds and to stop using respirators.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-61615, filed 12/21/04, effective 04/02/05.]

WAC 296-307-618 Labeling of air-purifying respirator filters, cartridges, and canisters.

Your responsibility:

To make sure employees, their supervisors, and program administrators can easily check for the correct air-purifying filters, cartridges, and canisters on respirators.

Exemption: This section does **NOT** apply to filtering-facepiece respirators when used voluntarily. See WAC 296-307-598 for voluntary use requirements.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-618, filed 12/21/04, effective 04/02/05.]

WAC 296-307-61805 Keep labels readable on respirator filters, cartridges, and canisters during use.

You must:

- Make sure the NIOSH certification labeling and color-coding on air-purifying respirator filters, cartridges, and canisters remains readable and intact during use.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-61805, filed 12/21/04, effective 04/02/05.]

WAC 296-307-620 Required procedures for respiratory protection program.

Your responsibility:

To use the procedures and questionnaire provided in this section when implementing your respiratory protection program.

You must:

Use this medical questionnaire for medical evaluations
WAC 296-307-62005
Follow these fit-testing procedures for tight-fitting respirators
WAC 296-307-62010
Follow procedures established for cleaning and disinfecting respirators
WAC 296-307-62015
Follow procedures established for seal checking respirators
WAC 296-307-62020.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-620, filed 12/21/04, effective 04/02/05.]

WAC 296-307-62005 Use this medical questionnaire for medical evaluations.

You must:

- Use the medical questionnaire in Table 10 when conducting medical evaluations.

Note:

- You may use a physical exam instead of this questionnaire if the exam covers the same information as the questionnaire.
- You may use on-line questionnaires if the questions are the same and the requirements in WAC 296-307-604 of this part are met.
- You may choose to send the questionnaire to the LCHP ahead of time, giving time to review it and add any necessary questions.
- The LHCP determines what questions to add to the questionnaire, if any; however, questions in Parts 1-3 may not be deleted or substantially altered.

WAC 296-307-62005 (Cont.)

Table 10

WISHA Medical Evaluation Questionnaire
Employer instructions:
• You may use on-line questionnaires if the requirements in WAC 296-307-60405 are met.
• You must tell your employee how to deliver or send the completed questionnaire to the healthcare provider you have selected.
• You must **NOT** view employees' questionnaires.
Healthcare provider's instructions:
• Review the information in this questionnaire and any additional information provided to you by the employer.
• You may add questions to this questionnaire at your discretion; HOWEVER, questions in Parts 1-3 may not be deleted or substantially altered.
• Follow-up evaluation is required for any positive response to questions 1-8 in Part 2, or questions 1-6 in Part 3. This might include: Phone consultations to evaluate positive responses, medical tests, and diagnostic procedures.
• When your evaluation is complete, send a copy of your written recommendation to the employer AND employee.
Employee information and instructions:
• Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that's convenient to you.
• Your employer or supervisor must not look at or review your answers at any time.

WAC 296-307-62005 (Cont.)

Part 1 - Employee Background Information

All employees must complete this part

Please print

1. Today's date:

2. Your name:

3. Your age (to nearest year):

4. Sex (circle one): Male / Female

5. Your height: ft. in.

6. Your weight: lbs.

7. Your job title:

8. A phone number where you can be reached by the healthcare professional who reviews this questionnaire (include Area Code):
9. The best time to call you at this number:

10. Has your employer told you how to contact the healthcare professional who will review this questionnaire? Yes / No

11. Check the type of respirator(s) you will be using:

a. N, R, or P filtering-facepiece respirator (for example, a dust mask, or an N95 filtering-facepiece respirator).
b. Check all that apply.

□ Half mask □ Full facepiece mask □ Helmet hood □ Escape

□ Nonpowered cartridge or canister □ Powered air-purifying cartridge respirator (PAPR)

□ Supplied-air or Air-line

Self-contained breathing apparatus (SCBA): □ Demand or □ Pressure demand

Other:

12. Have you previously worn a respirator? Yes / No

If "yes," describe what type(s):

WAC 296-307-62005 (Cont.)

Part 2 - General Health Information			
All employees must complete this part			
Please circle "Yes" or "No"			
1. Do you *currently* smoke tobacco, or have you smoked tobacco in the last month?	Yes	/	No
2. Have you *ever had* any of the following conditions?			
a. Seizures (fits):	Yes	/	No
b. Diabetes (sugar disease):	Yes	/	No
c. Allergic reactions that interfere with your breathing:	Yes	/	No
d. Claustrophobia (fear of closed-in places):	Yes	/	No
e. Trouble smelling odors:	Yes	/	No
3. Have you *ever had* any of the following pulmonary or lung problems?			
a. Asbestosis:	Yes	/	No
b. Asthma:	Yes	/	No
c. Chronic bronchitis:	Yes	/	No
d. Emphysema:	Yes	/	No
e. Pneumonia:	Yes	/	No
f. Tuberculosis:	Yes	/	No
g. Silicosis:	Yes	/	No
h. Pneumothorax (collapsed lung):	Yes	/	No
i. Lung cancer:	Yes	/	No
j. Broken ribs:	Yes	/	No
k. Any chest injuries or surgeries:	Yes	/	No
l. Any other lung problem that you have been told about:	Yes	/	No
4. Do you *currently* have any of the following symptoms of pulmonary or lung illness?			
a. Shortness of breath:	Yes	/	No
b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline:	Yes	/	No
c. Shortness of breath when walking with other people at an ordinary pace on level ground:	Yes	/	No
d. Have to stop for breath when walking at your own pace on level ground:	Yes	/	No
e. Shortness of breath when washing or dressing yourself:	Yes	/	No

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Part 2 (Continued)

f. Shortness of breath that interferes with your job:	Yes	/	No
g. Coughing that produces phlegm (thick sputum):	Yes	/	No
h. Coughing that wakes you early in the morning:	Yes	/	No
i. Coughing that occurs mostly when you are lying down:	Yes	/	No
j. Coughing up blood in the last month:	Yes	/	No
k. Wheezing:	Yes	/	No
l. Wheezing that interferes with your job:	Yes	/	No
m. Chest pain when you breathe deeply:	Yes	/	No
n. Any other symptoms that you think may be related to lung problems:	Yes	/	No
5. Have you *ever had* any of the following cardiovascular or heart problems?	Yes	/	No
a. Heart attack:	Yes	/	No
b. Stroke:	Yes	/	No
c. Angina:	Yes	/	No
d. Heart failure:	Yes	/	No
e. Swelling in your legs or feet (not caused by walking):	Yes	/	No
f. Heart arrhythmia (heart beating irregularly):	Yes	/	No
g. High blood pressure:	Yes	/	No
h. Any other heart problem that you have been told about:	Yes	/	No
6. Have you *ever had* any of the following cardiovascular or heart symptoms?			
a. Frequent pain or tightness in your chest:	Yes	/	No
b. Pain or tightness in your chest during physical activity:	Yes	/	No
c. Pain or tightness in your chest that interferes with your job:	Yes	/	No
d. In the past 2 years, have you noticed your heart skipping or missing a beat:	Yes	/	No
e. Heartburn or indigestion that's not related to eating:	Yes	/	No
f. Any other symptoms that you think may be related to heart or circulation problems:	Yes	/	No
7. Do you *currently* take medication for any of the following problems?	Yes	/	No
a. Breathing or lung problems:	Yes	/	No
b. Heart trouble:	Yes	/	No
c. Blood pressure:	Yes	/	No

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Part 2 (Continued)

d. Seizures (fits):	Yes	/	No
8. If you have used a respirator, have you *ever had* any of the following problems? (If you have never used a respirator, check the following space and go to question 9):			
a. Eye irritation:	Yes	/	No
b. Skin allergies or rashes:	Yes	/	No
c. Anxiety:	Yes	/	No
d. General weakness or fatigue:	Yes	/	No
e. Any other problem that interferes with your use of a respirator?	Yes	/	No
9. Would you like to talk to the healthcare professional who will review this questionnaire about your answers?	Yes	/	No

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Part 3 - Additional Questions for Users of Full-Facepiece Respirators or SCBAs			
Please circle "Yes" or "No"			
1. Have you *ever lost* vision in either eye (temporarily or permanently)?	Yes	/	No
2. Do you *currently* have any of these vision problems?			
a. Need to wear contact lenses:	Yes	/	No
b. Need to wear glasses:	Yes	/	No
c. Color blindness:	Yes	/	No
d. Any other eye or vision problem:	Yes	/	No
3. Have you *ever had* an injury to your ears, including a broken ear drum?	Yes	/	No
4. Do you *currently* have any of these hearing problems?			
a. Difficulty hearing:	Yes	/	No
b. Need to wear a hearing aid:	Yes	/	No
c. Any other hearing or ear problem:	Yes	/	No
5. Have you *ever had* a back injury?	Yes	/	No
6. Do you *currently* have any of the following musculoskeletal problems?			
a. Weakness in any of your arms, hands, legs, or feet:	Yes	/	No
b. Back pain:	Yes	/	No
c. Difficulty fully moving your arms and legs:	Yes	/	No
d. Pain or stiffness when you lean forward or backward at the waist:	Yes	/	No
e. Difficulty fully moving your head up or down:	Yes	/	No
f. Difficulty fully moving your head side to side:	Yes	/	No
g. Difficulty bending at your knees:	Yes	/	No
h. Difficulty squatting to the ground:	Yes	/	No
i. Climbing a flight of stairs or a ladder carrying more than 25 lbs:	Yes	/	No
j. Any other muscle or skeletal problem that interferes with using a respirator:	Yes	/	No

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Part 4 - Discretionary Questions

Complete questions in this part only if your employer's healthcare provider says they are necessary

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen?	Yes	/	No
If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you are working under these conditions:	Yes	/	No
2. Have you ever been exposed (at work or home) to hazardous solvents, hazardous airborne chemicals (such as gases, fumes, or dust), or have you come into skin contact with hazardous chemicals?	Yes	/	No
If "yes," name the chemicals, if you know them:			
3. Have you ever worked with any of the materials, or under any of the conditions, listed below:			
a. Asbestos?	Yes	/	No
b. Silica (for example, in sandblasting)?	Yes	/	No
c. Tungsten/cobalt (for example, grinding or welding this material)?	Yes	/	No
d. Beryllium?	Yes	/	No
e. Aluminum?	Yes	/	No
f. Coal (for example, mining)?	Yes	/	No
g. Iron?	Yes	/	No
h. Tin?	Yes	/	No
i. Dusty environments?	Yes	/	No
j. Any other hazardous exposures?	Yes	/	No
If "yes," describe these exposures:			
4. List any second jobs or side businesses you have:			
5. List your previous occupations:			
6. List your current and previous hobbies:			
7. Have you been in the military services?	Yes	/	No
If "yes," were you exposed to biological or chemical agents (either in training or combat)?	Yes	/	No
8. Have you ever worked on a HAZMAT team?	Yes	/	No
9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications)?	Yes	/	No
If "yes," name the medications if you know them:			
10. Will you be using any of the following items with your respirator(s)?			

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Part 4 (Continued)

a. HEPA filters: Yes / No

b. Canisters (for example, gas masks): Yes / No

c. Cartridges: Yes / No

11. How often are you expected to use the respirator(s)?

a. Escape-only (no rescue): Yes / No

b. Emergency rescue only: Yes / No

c. Less than 5 hours *per* week: Yes / No

d. Less than 2 hours *per* day: Yes / No

e. 2 to 4 hours *per* day: Yes / No

f. Over 4 hours *per* day:

12. During the period you are using the respirator(s), is your work effort:

a. *Light* (less than 200 kcal per hour): Yes / No

If "yes," how long does this period last during the average shift: hrs. mins.
Examples of a light work effort are sitting while writing, typing, drafting, or performing light assembly work; or standing while operating a drill press (1-3 lbs.) or controlling machines.

b. Moderate (200 to 350 kcal per hour): Yes / No

If "yes," how long does this period last during the average shift: hrs. mins.
Examples of moderate work effort are sitting while nailing or filing; driving a truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; walking on a level surface about 2 mph or down a 5-degree grade about 3 mph; or pushing a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

c. *Heavy* (above 350 kcal per hour): Yes / No

If "yes," how long does this period last during the average shift: hrs. mins.
Examples of heavy work are lifting a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you are using your respirator? Yes / No
If "yes," describe this protective clothing and/or equipment:

14. Will you be working under hot conditions (temperature exceeding 77°F): Yes / No

15. Will you be working under humid conditions: Yes / No

16. Describe the work you will be doing while using your respirator(s):

17. Describe any special or hazardous conditions you might encounter when you are using your respirator(s) (for example, confined spaces, life-threatening gases):

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Part 4 (Continued)

18. Provide the following information, if you know it, for each toxic substance that you will be exposed to when you are using your respirator(s):
Name of the first toxic substance:

Estimated maximum exposure level per shift:

Duration of exposure per shift:

Name of the second toxic substance:

Estimated maximum exposure level per shift:

Duration of exposure per shift:

Name of the third toxic substance:

Estimated maximum exposure level per shift:

Duration of exposure per shift:

The name of any other toxic substances that you will be exposed to while using your respirator:

19. Describe any special responsibilities you will have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, security).

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-62005, filed 12/21/04, effective 04/02/05.]

WAC 296-307-62010 Follow these fit-testing procedures for tight-fitting respirators.

Important:

- This section contains procedural requirements that apply during actual fit testing.
- See WAC 296-307-606 of this part for fit-testing requirements that apply to your overall program.

Exemptions: This section does **NOT** apply to employees who:

- Voluntarily use respirators
  OR
- Are required to use mouthpiece respirators.

You must:

- Conduct fit testing according to all of the following:
  - Follow the procedure in Table 11 to choose a respirator for fit testing:
    - Prior to conducting fit tests
      AND
    - Any time your employee must select a different respirator such as when a previously selected respirator fails a test
  - Select and follow at least one of the following fit test procedures:
    - Qualitative fit-test procedures:
      - Isoamyl acetate vapor (IAA, banana oil) in Table 12
      - Saccharine aerosol in Table 13
      - Bitrex™ aerosol in Table 14
      - Irritant smoke in Table 15
    - Quantitative fit-test procedures:
      - Ambient aerosol condensation nuclei counter such as the Portacount™, in Table 16
      - Controlled negative pressure (CNP) such as the FitTester 3000™, in Table 17
      - Generated aerosol in Table 18
  - Make sure employees perform the appropriate fit-test exercises listed in Table 19.
  - Clean and maintain equipment according to the manufacturer's instructions.
  - Make sure during fit testing employees wear any safety equipment that could:
    - Interfere with respirator fit
      AND
    - Be worn in the workplace. For example, chemical splash goggles.
  - Check, prior to fit testing, for conditions that may interfere with the respirator seal or valve functions. If you find such conditions, don't conduct fit testing for that individual.

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Note: Examples of conditions that may interfere with the respirator seal or valve functions include:

- Moustache, stubble, sideburns, bangs, hairline, and other types of facial hair in areas where the respirator facepiece seals or that interfere with valve function
- Temple bars of corrective eyewear or headgear that extend through the face seal area.

Table 11

Procedure for Choosing a Respirator for Fit Testing
1. **Inform** the employee:
• To choose the most comfortable respirator that provides an adequate fit
• That each respirator sample represents a different size and, if more than one model is supplied, a different shape
• That if fitted and used properly, the respirator chosen will provide adequate protection
2. **Provide** a mirror and show the employee how to:
• Put on the respirator
• Position the respirator on the face
• Set strap tension.
Note: This instruction does NOT take the place of the employee's formal training since it is only a review.
3. **Review** with the employee how to check for a comfortable fit around the nose, cheeks and other areas on the face.
• Tell the employee the respirator should be comfortable while talking or wearing eye protection.
4. **Have the employee hold** each facepiece against the face, taking enough time to compare the fit of each. The employee can then either:
• Reject any facepiece that clearly doesn't feel comfortable or fit adequately
OR
• Choose which facepiece is most acceptable and which is less acceptable, if any.
Note: • Supply as many respirator models and sizes as needed to make sure the employee finds a respirator that's acceptable and fits correctly • To save time later, during this step note the more acceptable facepieces in case the one chosen fails the fit test or proves unacceptable later.

WAC 296-307-62010 (Cont.)

Table 11 (Continued)

5. **Have the employee wear** the most acceptable respirator for **AT LEAST** 5 minutes to evaluate comfort and fit. Do **ALL** of the following during this time:
• Ask the employee to observe and comment about the comfort and fit:
– Around the nose, cheeks, and other areas on the face
– When talking or wearing eye protection
• Have the employee put on the respirator and adjust the straps until they show proficiency
• Evaluate the respirator's general fit by checking:
– Proper chin placement
– Properly tightened straps (do **NOT** over tighten)
– Acceptable fit across the nose bridge
– Respirator size; it must span the distance from nose to chin
– To see if the respirator stays in position
• Have the employee complete a successful seal check as specified in WAC 296-307-62020 of this chapter
– Prior to the seal check they must settle the respirator on their face by taking a few slow deep breaths **WHILE SLOWLY**:
♦ Moving their head from side-to-side
AND
♦ Up and down.
6. **If the employee finds the respirator unacceptable**, allow the employee to select another one and return to Step 5. Otherwise, proceed to Step 7.
7. **Before starting the fit test**, you must:
• Describe the fit test including screening procedures, employee responsibilities, and test exercises
AND
• Make sure the employee wears the respirator **AT LEAST** five minutes.

WAC 296-307-62010 (Cont.)

Table 12

Isoamyl Acetate (Banana Oil) Vapor Test Procedure
Important:
• This is a qualitative fit-test (QLFT) procedure
• The success of this test depends on preserving the employee's odor sensitivity to isoamyl acetate (IAA) vapor
– Vapor accumulations in ambient air can decrease odor sensitivity. To prevent this:
♦ Prepare **ALL** solutions in a location separate from screening and test areas
♦ Conduct screening and tests in separate well-ventilated rooms. For example, use an exhaust fan or laboratory hood to prevent IAA vapor from accumulating in the room air
– Always use odor-free water, for example, distilled or spring water that's 25°C (77.°F).
• Isoamyl acetate is also known as isopentyl acetate.
Screening Preparations
Important:
Odor threshold screening determines if the employee can detect weak concentrations of IAA vapor.
1. Choose an appropriate location to conduct screening.
• Conduct screening and tests in separate well-ventilated rooms.
2. Prepare a stock solution **AT LEAST** weekly as follows:
• Add one milliliter (ml) of pure IAA to 800 ml of odor-free water in a one-liter glass jar with a metal lid using a measuring dropper or pipette
• Seal the jar with the lid and shake it for 30 seconds
• Clean the dropper or pipette.
3. Prepare the odor test solution daily as follows:
• Add 0.4 ml from the stock solution to 500 ml of water in a one liter glass jar with a metal lid using a clean pipette or dropper
• Seal the jar with the lid and shake it for 30 seconds
• Let this solution stand for 2-3 minutes so the IAA concentration above the liquid reaches equilibrium

WAC 296-307-62010 (Cont.)

Table 12 (Continued)

• Label this jar so you know the contents but the employee can't know its contents, for example, "1."
Note: To maintain the integrity of the test, use labels that peel off easily **AND** periodically switch the labels.
4. Prepare a "test blank" solution as follows:
• Add 500 ml of odor-free water to a one liter glass jar with a metal lid
• Seal the jar
• Label the jar so you know the contents but the employee can't know its contents.
5. Type or neatly print the following instructions on a card and place it on the table in front of the two test jars:
*"The purpose of this test is to find out if you can smell banana oil at a low concentration. While both jars contain water, one **ALSO** contains a small amount of banana oil.*
Make sure the lid is secure then pick up a jar and shake it for two seconds. Open the jar and sniff at the opening. Repeat this for the second jar.
Tell the individual conducting the fit test which jar contains banana oil."
Test Preparations
6. Choose an appropriate location to conduct fit testing.
• Conduct screening and tests in separate well-ventilated rooms.
7. Assemble the fit test enclosure in the room.
• Invert a clear 55-gallon drum liner over a circular 2-foot diameter frame made of plywood or other lightweight rigid material or construct a similar enclosure using plastic sheeting
• Hang the frame with the plastic covering so the top of the enclosure is about six inches above the employee's head
• Attach a small hook inside top center of the enclosure
• Tape a copy of the test exercises (see Table 28) to the inside of the test enclosure where the employee can read it.
8. Have organic vapor cartridges or equivalent on hand for each employee's chosen respirator.

WAC 296-307-62010 (Cont.)

Table 12 (Continued)

9. Have ready a 6 x 5-inch piece of paper towel or other porous absorbent single-ply material **AND** 0.75 ml of pure IAA. Do **NOT** apply IAA yet.
Note: As an alternative to using the paper towel, you may use an IAA test swab or ampoule if it has been demonstrated to generate an equivalent test concentration.
Screening
10. Have the employee, while **NOT** wearing a respirator, follow the instructions on the card provided.
• If the employee correctly identifies the jar containing IAA, proceed to conduct testing (Step 11)
• If the employee is **NOT** able to correctly identify the jar containing IAA, you must **STOP** and use a different fit test protocol.
Test
11. **BEFORE** entering the fit test room, have the employee attach cartridges, put on, properly adjust, and seal check the respirator. Have the employee enter the test enclosure.
12. Wet the paper towel with 0.75 ml of **pure** IAA **AND** fold it in half.
13. Pass the paper towel to the employee inside the enclosure **AND** instruct the employee to hang it on the hook at the top of the enclosure.
14. Wait two minutes for the IAA vapor to fill the enclosure.
• While waiting, explain the fit test, including the purpose of the test exercises, the importance of cooperation, and that you must be informed if a banana-like odor is detected during the test
• You may also demonstrate the test exercises.
15. Have the employee perform the appropriate fit-test exercises in Table 19.
• If the employee does **NOT** detect IAA while performing test exercises, the fit test has been **PASSED**. Proceed as follows:
– **BEFORE** leaving the enclosure, have the employee break the respirator seal and inhale. If they **detect** IAA, the test is valid
– When exiting the employee must remove the paper towel and give it to the individual conducting the fit test. This prevents IAA vapor from building up in the enclosure during subsequent tests
– The individual conducting the fit test must keep used paper towels in a self-sealing plastic bag to prevent area contamination

WAC 296-307-62010 (Cont.)

Table 12 (Continued)

	• If the employee detects IAA during any test exercise, the fit test has **FAILED**. **STOP** and have the employee do the following:
	– Quickly return to the selection room to remove the respirator. This avoids decreasing the employee's odor sensitivity
	– Select another respirator
	– Repeat screening and testing
	♦ At this stage, if the employee fails the screening part of this procedure, the employee can repeat it **AFTER** waiting at least five minutes for odor sensitivity to return.

WAC 296-307-62010 (Cont.)

Table 13

Saccharin Aerosol Test Procedure
Screening Preparations
Important:
• This is a qualitative fit-test (QLFT) procedure
• Taste threshold screening determines whether the employee being tested can detect the taste of saccharin
– The employee must **NOT** eat, smoke, chew gum or drink anything but plain water for at least fifteen minutes **BEFORE** the fit test. Sweet foods or drink consumed before the test may make the employee unable to detect saccharin during screening
– Nebulizers must be thoroughly rinsed in water and shaken dry:
♦ Each morning and afternoon
OR
♦ At least every four hours.
• You may use commercially prepared solutions if they meet the requirements in this procedure.
1. Obtain a test enclosure (hood) that meets the following specifications:
• Twelve inches in diameter by fourteen inches tall
• A clear front portion
• Enough space inside to allow free movement of the head when a respirator is worn
• A 3/4 inch (or 1.9 centimeter) hole to accommodate the nebulizer nozzle. The hole must line up in front of the wearer's nose and mouth.
Note: • An enclosure similar to the 3M hood assembly, parts #FT 14 and #FT 15 combined, meets these specifications • This enclosure can also be used for testing.
2. Obtain and assemble two clean DeVilbiss Model 40 Inhalation Medication Nebulizers or equivalent.
3. Prepare the screening solution as follows:
• Dissolve 83.0 milligrams of sodium saccharin USP in 100 ml of warm distilled water
OR
• **IF** you have already prepared the fit-test solution, you can make the screening solution by adding 1 ml of this solution to 100 ml of distilled water.

WAC 296-307-62010 (Cont.)

Table 13 (Continued)

4. Add about 1 ml of the screening solution to one of the nebulizers.
• Mark this nebulizer to distinguish it from the one to be used for fit testing.
Test Preparations
5. Prepare the fit-test solution as follows:
• Add 83.0 grams of sodium saccharin to 100 ml of warm water.
6. Add about 1 ml of the test solution to the second nebulizer.
• Mark this nebulizer to distinguish it from the one used for screening
7. Have particulate filters ready for the employee's chosen respirator or have filtering-facepiece respirators ready.
Screening
8. Have the employee, while **NOT** wearing a respirator, put on the test enclosure.
9. Instruct the employee to:
• Breath through a slightly open mouth with tongue extended during screening **AND** testing
• Immediately report when a sweet taste is detected.
10. Insert the nebulizer into the front hole of the test enclosure **AND** administer saccharin as follows:
• Direct the nozzle away from the employee's nose and mouth
• Complete 10 squeezes in rapid succession
• Each time firmly squeeze the bulb so it collapses completely, then release and allow it to fully expand.
11. Ask the employee if a sweet taste is detected.
• If **YES**, screening is completed. Proceed to conduct testing, Step 14, **AFTER** you:
– Ask the employee to remember the taste for reference during the fit test
– Note the employee's taste threshold as "10" regardless of the number of squeezes actually completed
• If **NO**, screening must continue. Proceed to Step 12.
12. Repeat with 10 more squeezes. Then follow Step 11 again; **EXCEPT** this time note the employee's taste threshold as "20" **IF** a sweet taste is reported.
• If a sweet taste is still **NOT** detected, repeat with 10 more squeezes and follow Step 11 one last time; **EXCEPT** this time note "30" for the taste threshold if a sweet taste is reported.

WAC 296-307-62010 (Cont.)

Table 13 (Continued)

13. If **NO** sweet taste is reported after 30 squeezes, you must **STOP** and choose a different fit-test protocol for the employee.
Test
Important!
• Periodically check nebulizers to make sure they don't clog during use. A test is **NOT** valid if the nebulizer is clogged at the end of the test.
14. Have the employee attach particulate filters, put on, properly adjust, and seal check the respirator. Have the employee put on the test enclosure (hood).
15. Instruct the employee to immediately report if a sweet taste is detected.
16. Insert the nebulizer into the front hole of the test enclosure **AND** administer the same number of squeezes, either 10, 20, or 30, as noted during screening.
17. Have the employee perform the appropriate fit-test exercises as described in Table 19. During this step:
• Replenish the aerosol in the hood **EVERY** 30 seconds using 1/2 the number of squeezes used in Step 16, either 5, 10, or 15
• The employee must report if a sweet taste is detected:
– If **NO** saccharin is tasted, the test has been **PASSED**
♦ If saccharin is tasted the test has **FAILED**, have the employee select another respirator
AND
♦ Repeat screening and testing.

WAC 296-307-62010 (Cont.)

Table 14

Bitrex™ Aerosol Test Procedure
Important!
• This is a qualitative fit-test (QLFT) procedure
• Bitrex™ (denatonium benzoate) is routinely used as a taste aversion agent in household liquids that children shouldn't drink and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers
• The employee must **NOT** eat, smoke, chew gum or drink anything but plain water for at least fifteen minutes **BEFORE** the fit test.
Screening Preparations
Important!
• Taste threshold screening determines whether the employee being tested can detect the taste of Bitrex™
• Nebulizers must be thoroughly rinsed in water and shaken dry:
– Each morning and afternoon
OR
– At least every four hours.
• You may use commercially prepared solutions if they meet the requirements in this procedure.
1. Obtain a test enclosure that meets the following specifications:
• Twelve inches in diameter by fourteen inches tall
• A clear front portion
• Enough space inside the front to allow free movement of the head when a respirator is worn
• 3/4 inch (or 1.9 centimeter) hole to accommodate the nebulizer nozzle. The hole must line up in front of the wearer's nose and mouth.
Note: • An enclosure similar to the 3M hood assembly, parts #FT 14 and #FT 15 combined, meets these specifications • This enclosure can also be used for testing.
2. Obtain and assemble two clean DeVilbiss Model 40 Inhalation Medication Nebulizers or equivalent:

WAC 296-307-62010 (Cont.)

Table 14 (Continued)

3. Prepare the screening solution as follows:
• Make up a 5% salt solution by dissolving 5.0 grams of salt (sodium chloride) into 100 ml of distilled water
• Dissolve 13.5 milligrams of Bitrex™ in the salt solution.
4. Add about 1 ml of the screening solution to one of the nebulizers.
• Mark this nebulizer to distinguish it from the one to be used for fit testing.
Test Preparations
5. Prepare the fit test solution.
• Dissolve 10.0 grams of salt (sodium chloride) into 200 ml of distilled water
• Add 337.5 milligrams of Bitrex™ to the warmed salt solution.
6. Add about 1 ml of the test solution to the second nebulizer.
• Mark this nebulizer to distinguish it from the one used for screening.
7. Have particulate filters ready for the employee's chosen respirator or have filtering-facepiece respirators ready.
Screening
Important: The employee must **NOT** eat, smoke, chew gum or drink anything but plain water for at least fifteen minutes **BEFORE** the screening and test
8. Have the employee, while not wearing a respirator, put on the test enclosure.
9. Instruct the employee to:
• Breath through a slightly opened mouth with tongue extended during screening **AND** testing
• Immediately report when a bitter taste is detected.
10. Insert the nebulizer into the front hole of the test enclosure **AND** administer Bitrex™ as follows:
• Direct the nozzle away from the employee's nose and mouth
• Complete 10 squeezes in rapid succession
• Each time firmly squeeze the bulb so it collapses completely, then release and allow it to fully expand.
11 Ask the employee whether a bitter taste is detected.
• If **YES**, screening is completed. Proceed to conduct testing, Step 14, **AFTER** you:
– Ask the employee to remember the taste for reference during the fit test

WAC 296-307-62010 (Cont.)

Table 14 (Continued)

– Note the employee's taste threshold as "10," regardless of the number of squeezes actually completed
• **IF** no, screening must continue. Proceed to Step 12.
12. Repeat with 10 more squeezes. Then follow Step 11 again; **EXCEPT** this time note the employee's taste threshold as "20" **IF** a bitter taste is reported.
• If a bitter taste is still **NOT** detected repeat with 10 more squeezes and follow Step 11 one last time; **EXCEPT** this time note "30" for the taste threshold if a bitter taste is reported.
13. If **NO** bitter taste is reported after 30 squeezes, you must **STOP** and choose a different fit-test protocol for the employee.
Test
14. Have the employee attach particulate filters, put on, properly adjust, and seal check the respirator. Have the employee put on the test enclosure.
15. Instruct the employee to:
• Breathe through a slightly opened mouth with tongue extended during screening and testing
• Immediately report when a bitter taste is detected.
16. Insert the nebulizer into the front hole of the test enclosure **AND** administer the same number of squeezes, either 10, 20, or 30, as noted during screening.
17. Have the employee perform the appropriate fit-test exercises as described in Table 19. During this step:
• Replenish the aerosol in the hood **EVERY** 30 seconds using 1/2 the number of squeezes used in Step 16, either 5, 10, or 15
• The employee must report if a bitter taste is detected:
– If **NO** Bitrex™ is tasted, the test has been **PASSED**
– If Bitrex™ is tasted the test has **FAILED**. Have the employee:
♦ Select another respirator
AND
♦ Repeat all screening and testing steps.

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Table 15

Irritant Smoke (Stannic Chloride) Test Procedure
Important:
• **DO NOT USE A TEST ENCLOSURE OR HOOD FOR THIS FIT TEST!**
• This is a qualitative fit-test (QLFT) procedure
• During this test an employee is exposed to irritating smoke containing hydrochloric acid produced by a stannic chloride ventilation smoke tube to detect leakage. The smoke will irritate eyes, lungs, and nasal passages
• Employee sensitivity varies, and certain employees may respond more intensely than others exposed to irritant smoke. The individual conducting the fit test must take precautions to minimize the employees' exposure to irritant smoke
• Conduct fit testing in an area with adequate ventilation to prevent exposure of the individual conducting the fit test and build-up of irritant smoke in the ambient air.
Screening and Test Preparations
Important:
Sensitivity screening is necessary to determine whether the employee can detect a weak concentration of irritant smoke **AND** whether any gross facepiece leakage is detected.
1. Obtain only stannic chloride (ventilation) smoke tubes, **AND** an aspirator squeeze bulb **OR** use a low-flow air pump set to deliver 200 milliliters of air flow per minute.
2. Equip the employee's chosen respirator with P100 series filters if a negative pressure air-purifying respirator will be tested. If a powered air-purifying respirator (PAPR) will be tested equip the respirator with high-efficiency particulate air (HEPA) filters.
Screening
Important!
When performing sensitivity screening checks use only the **MINIMUM** amount of smoke necessary to elicit a response from the employee.
3. Advise the employee that the smoke can be irritating to eyes, lungs, and nasal passages **AND** instruct the employee to keep eyes closed while exposed.
4. Break both ends of the ventilation smoke tube **AND** fit a short piece of plastic tubing, for example, two-to-six inches of tygon tubing, over one end to prevent exposure to the sharp end of the tube. Connect the other end to an aspirator bulb or a low-flow air pump set to deliver a flow of 200 ml per minute.
5. While the employee is **NOT** wearing a respirator, have the employee smell a weak concentration of irritant smoke to become familiar with its irritating properties.
• Carefully direct a small amount of irritant smoke toward the employee.

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Table 15 (Continued)

Test
Test 6. Have the employee attach respirator filters, put on, adjust, and seal check the respirator without assistance. The employee must be proficient at these tasks.
7. Remind the employee to keep eyes closed during testing.
8. Direct a stream of irritant smoke toward the respirator's face seal area as follows:
• Begin at least 12 inches from the facepiece **AND** move the smoke around the whole perimeter of the mask
• Gradually make two more passes around the perimeter of the facepiece, moving to within 6 inches of the respirator
• **STOP** at any time the employee detects smoke in the facepiece. If this occurs a different respirator will need to be chosen and tested, beginning with sensitivity screening.
9. Have the employee perform appropriate fit-test exercises in Table 19 **IF** the employee has **NOT** had an involuntary response such as evidence of coughing, flinching, or other response, **OR** detected smoke in the facepiece.
• Continue to direct smoke from a distance of 6 inches around the facepiece perimeter
– If smoke is detected at any time the test has **FAILED**. A different respirator must be chosen and tested, starting with sensitivity screening
– If **NO** smoke is detected proceed to Step 10.
10. Have the employee remove the respirator **AND** perform another sensitivity screening check as follows:
• Continue to use the smoke tube used for fit testing
• Carefully direct a **SMALL** amount of irritant smoke toward the employee
– The test has been **PASSED IF** the employee responds to the smoke
– The fit test is **VOIDED IF** the employee does **NOT** respond to the smoke.

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Table 16

Ambient Aerosol Condensation Nuclei Counter (Portacount™) Test Procedure
Important:
• This is a quantitative (QNFT) fit-test procedure
• This method uses a particle counting instrument that measures and compares the particle concentration both inside and outside the respirator facepiece while the employee performs a series of test exercises
• Particles in the ambient air are used as the test aerosol.
Test Preparations
1. Obtain a test instrument such as a Portacount™.
2. Have probed respirators available for each respirator model and size the employer uses, **OR** have a sampling adapter available if the employee's actual or chosen respirator will be tested.
Note: • A probed respirator has a special fitting installed on the facepiece designed to connect with the end of the test instrument's plastic sampling tube so that air samples can be taken inside the facepiece. Probed respirators can be obtained from the respirator manufacturer, or distributor, **AND** can only be used for fit-testing purposes • Contact TSI Inc., **OR** the respirator's manufacturer to obtain probed respirators or facepiece sampling adapters.
3. Follow the test instrument manufacturer's instructions for test preparation, including particle, zero, and system checks. Make sure the instrument's pass **OR** fail criterion is programmed to the following **MINIMUM** performance levels:
• For half-facepiece respirators, an overall minimum fit factor of 100 as a passing level
• For full-facepiece respirators, an overall minimum fit factor of 500 as a passing level
4. Have high-efficiency particulate air (HEPA) filters, **OR** other respirator filters available that are capable of preventing significant penetration by particles generated by the test instrument such as, P100 or N95 series filters.
• If you'll use a sampling adapter instead of probed respirators be sure to have the correct type for the respirators chosen.
Test
5. Properly attach the sampling line to the facepiece probe or sampling adapter.
6. Have the employee attach respirator filters, put on, properly adjust, and wear the respirator five minutes **BEFORE** the fit test. During this time you and the employee must evaluate the respirator's general fit by checking:

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Table 16 (Continued)

	• Proper chin placement
	• Properly tightened straps (do **NOT** over tighten)
	• Acceptable fit across the nose bridge
	• Respirator size. It must span the distance from nose to chin
	• To see if the respirator stays in position.
	Note: Wearing the respirator for five minutes permits the employee to make certain the respirator is comfortable **AND** allows for purging of ambient particles trapped inside the facepiece.
7. Have the employee perform a seal check. Make sure the sampling line is crimped to avoid leakage during the seal check. If **NO** leakage is detected, proceed to Step 8. If leakage is detected:	
	• Determine the cause
	AND
	• If leakage is due to a poorly fitting facepiece, have the employee:
	– Choose another respirator size or model
	AND
	– Start again at Step 6.
8. Start the fit test cycle.	
	• Follow the manufacturer's instructions for operating the test instrument
	• Have the employee perform the appropriate fit-test exercises in Table 19
	– The test instrument will automatically stop and calculate the overall fit factor. Use this result to determine whether or not the test is passed
	♦ The test has been **PASSED** if the overall fit factor is at least 100 for a half facepiece, **OR** 500 for a full facepiece
	♦ The test has **FAILED** if the overall fit factor is below 100 for a half facepiece or 500 for a full facepiece.
	Note: If the test has failed, have the employee select another respirator model or size following Table 11 **AND** repeat this procedure.

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Table 17

Controlled Negative Pressure (CNP) Test Procedure
Important!
• This is a quantitative fit-test (QNFT) procedure
• This method determines respirator fit by measuring how much the facepiece leaks when it is subject to a slight negative pressure **AFTER** various premeasurement activities
• Measurements occur while employees remain still **AND** hold their breath for 10 seconds
• No test aerosols are used. Respirator cartridges aren't needed for this test.
Test Preparations
1. Make sure the individual conducting the fit test is thoroughly trained to perform this test.
2. Obtain a CNP test instrument such as a FitTester 3000™. Make sure:
• Defaults are set at:
– -15mm (-0.58 inches) of water test pressure
AND
– A modeled inspiratory flow rate of 53.8 liters per minute
• It has an effective audio warning device that signals when employees fail to hold their breath.
Note: • You are not required to obtain test recording and printing equipment such as computers or printers. Hand recording results is acceptable • To see default settings, check the instrument's "REDON protocol."
3. Obtain facepiece adapters appropriate for each test respirator.
Note: • Adapters are either a one-piece (for SCBA facepieces), or two-piece (for dual cartridge facepieces) device providing a manifold and breathing valve system. For positive pressure respirators, you will need to obtain an additional fitting, available from the respirator manufacturer, to convert the facepiece to negative pressure • To obtain adapters, contact the CNP instrument's distributor, Occupational Health Dynamics, **OR** the respirator manufacturer.

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Table 17 (Continued)

Test
Important!
After the test, you must ask the employee about the comfort of the respirator **AND** if the respirator has become unacceptable, another size or model must be chosen and tested.
4. Explain the test procedure to the employee.
5. Train the employee on how to hold a breath for at least 20 seconds.
6. Prepare the respirator for the fit test as follows:
• Remove or prop open the inhalation valves. If a breathing tube is present, disconnect it
• Replace cartridges, if present, with the manifold and breathing valve adapter
– For positive pressure facepieces, mount the manufacturer's additional fitting followed by the manifold-breathing valve adapter
• Connect the respirator to the CNP device according to the CNP instrument manufacturer's directions.
7. Have the employee put on, adjust, and seal check the respirator.
8. Turn on the instrument **AND** have the employee stand and perform the fit-test exercises in Table 19.
9. Interpret the test results:
• The test is **PASSED IF** the overall fit factor obtained is at least 100 for a half facepiece, or at least 500 for a full facepiece
• The test has **FAILED IF** the fit factor is less than 100 for a half facepiece; 500 for a full facepiece
– If the test has **FAILED** you must have the employee select another respirator model or size following the steps in Table 11 **AND** repeat this procedure, starting at Step 6.

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Table 18

Generated Aerosol Test Procedure
Important:
• This is a quantitative (QNFT) fit-test procedure
• In this method, a test aerosol is used to challenge the facepiece seal while aerosol concentrations inside and outside the facepiece are measured during test exercises
• Special equipment is needed to generate, disperse, detect, and measure test aerosols.
Test Preparations
1. Test aerosol.
• Use a particulate, for example, corn oil, polyethylene glycol 400, di-2-ethyl hexyl sebacate, or sodium chloride.
2. Instrumentation.
• Do **ALL** the following:
– Obtain and use aerosol generation, dilution, and measurement systems appropriate for particulates
– Use an aerosol-generating instrument that will maintain test concentrations within a 10% variation
– Select a sampling instrument that allows for a computer record or strip chart record to be created
♦ The record must show the rise and fall of test agent concentration during each inhalation and exhalation at fit factors of at least 2000.
Note: Integrators, or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise, may be used if a record of the readings is made.
– Minimize the time interval between the activity and the recording of the activity so you can clearly connect what you see to what is being recorded. For example, use a small diameter and length of sampling line.
3. Test enclosure.
• Do **ALL** the following:
– Make sure the enclosure is equipped and constructed to effectively:
♦ Maintain a uniform concentration of the test agent inside the enclosure. For example, the enclosure must be large enough to allow **ALL** employees freedom of movement during testing **WITHOUT** disturbing the test concentration or measurement instrument
♦ Keep the test agent from contaminating the air outside the enclosure. For example, use a HEPA filter to purify exhausted air
♦ Allow the individual conducting the fit test to view the employee during the test
– Make sure the tubing used to collect samples from the enclosure **AND** respirator is the same material, diameter, **AND** length. This makes the effect of aerosol loss caused by deposition in each sample line equal
– If sodium chloride is used, relative humidity inside the enclosure must be kept below 50%.

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Table 18 (Continued)

4. Prepare test respirators.
• Do **ALL** the following:
– Inspect test respirators regularly for missing parts and damage
– Keep test respirators in proper working order
– Make sure in-mask sampling probes are:
♦ Designed and installed so the air sample will be drawn from the employee's breathing zone; midway between the nose and mouth
AND
♦ The probe extends inside the facepiece at least 1/4 inch
– Make sure sampling ports such as probes, or adapters on respirators are constructed and installed so they do **NOT**:
♦ Block air flow into the sampling line
♦ Leak
♦ Interfere with the respirator's fit or performance
• Have high efficiency particulate air (HEPA) filters **OR** P100 series filter available
– Replace filters when increased breathing resistance is detected **OR** when the test agent has altered the filter material's integrity.
Test
Important!
• Throughout the test, maintain the employee's exposure to any test agent below the established exposure limit. Exposures allowed must be based on exposure time and exposure limit duration
• If a single peak penetration exceeds 5% for half facepieces or 1% for full facepieces:
–**STOP** the test
AND
– Have the employee select another respirator for testing.
5. Have the employee attach filters, put on, adjust, and seal check the respirator.
• Be sure to crimp the sampling line to avoid pressure leaks during the seal check
AND
• Have the employee adjust the respirator straps, without assistance, so the fit is comfortable. Do **NOT** over tighten.
6. **OPTIONAL Step**. To save time conduct a screening test to quickly identify poorly fitting respirators.
Note: You may use a qualitative screening test **OR** an ambient aerosol condensation nuclei counter instrument in the count mode.

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Table 18 (Continued)

7. Make sure test aerosol concentration is reasonably stable.
• If a canopy or shower curtain enclosure is used, determine stability of the test aerosol concentration **AFTER** the employee enters the enclosure.
8. Have the employee enter the test enclosure and connect the respirator to the sample lines.
9. Immediately after entering the enclosure measure test aerosol concentration inside the respirator.
• Make sure the peak penetration does **NOT** exceed 5% for half facepieces, **OR** 1% for full facepieces.
10. Have employee perform the appropriate fit-test exercises in Table 19.
• Do **NOT** adjust the respirator once exercises begin.
11. Calculate the overall fit factor as specified in Steps 12-13. The fit test is:
• **PASSED IF** the minimum fit factor of 100 for half facepieces **OR** 500 for full facepieces is obtained
OR
• **IF** a passing fit factor is **NOT** obtained, the test has **FAILED** and you must have the employee select and test another respirator.
Calculations
Important!
• Do **NOT** count the grimace exercise measurements during these calculations
• Take into account the limitations of instrument detection when determining fit factors.
12. Calculate individual fit factors for **EACH** exercise by applying the following:
Exercise fit factor (ffE) .= Average test enclosure concentration
Test aerosol concentration inside the respirator
• To determine the average test enclosure concentration use one of the following methods:
– Arithmetic average of the concentration before and after each **TEST** (an average of two values per entire test)
– Arithmetic average of concentration before and after each **EXERCISE** (an average of two values per exercise)
– True average measured continuously during the respirator sample
• Determine the test aerosol concentration inside the respirator in one of the following ways:
– Average peak penetration values. Determine aerosol penetration for each exercise by:
♦ Using integrators or computers that calculate the actual test agent penetration
OR
♦ Average the peak heights shown on the strip chart recording, graph, or by computer integration

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Table 18 (Continued)

		– Maximum peak penetration. Use strip chart recordings to determine the highest peak penetration for each exercise and use this value		
		– Area under the peaks. Use computerized integration or other appropriate calculations to integrate the area under individual peaks for each exercise.		
13. Using individual exercise fit factors (ffE) calculate the **overall fit factor** by doing **ALL** of the following:				
	• Convert each exercise fit factor to a penetration value			
	• Determine the average penetration value			
	• Convert the average penetration value back to a fit factor			
	OR			
	• Use this equation to calculate the overall fit factor:			
	Overall fit factor .=		N	
			1/ffE1 .+ 1/ffE2 .+ 1/ffE3 . . . .+ 1/ffEn	

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Table 19

Fit-Test Exercises			
Important: • This list applies when you use any fit test • Employees tested must perform all exercises marked with an "X" as described for the fit-test procedure used – Once exercises begin, any adjustments made void the test **AND** you must begin again – After test exercises are completed, you must ask the employee about the comfort of the respirator. If it has become unacceptable, have the employee choose another one for testing • When the controlled negative pressure procedure is used, **STOP and repeat** the test if the employee adjusts the respirator or takes a breath and fails to hold it for 10 seconds • Controlled negative pressure tests conducted according to the method published in 29 CFR 1910.134, Appendix A are an acceptable alternative to the method outlined below.			
Description of Required Fit-Test Exercises	**Fit-Test Procedures**		
	Qualitative Procedures	Quantitative Procedures; **except** the **CNPP**	Controlled Negative Pressure Procedure (CNPP)
• Normal breathing – Breathe normally, while standing for one minute	X	X	
• Deep breathing – Breathe slowly and deeply while standing for one minute – Take caution to avoid hyperventilating	X	X	
• Head side to side – Slowly turn head from side to side while standing for one minute, pausing at each extreme position to inhale – Be careful to **NOT** bump the respirator	X	X	
• Head up and down – Slowly move head up and down while standing for one minute, inhaling in the up position – Be careful to **NOT** bump the respirator	X	X	
• Talking – Talk slowly and loud enough to be heard clearly by the individual conducting fit testing for one minute. Choose **ONE** of the following:			

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Table 19 (Continued)

♦ Read from a prepared text such as the Rainbow Passage[1] ♦ Count backward from 100 ♦ Recite a memorized poem or song.	X	X	
• Grimace – Smile or frown for fifteen seconds.		X	
• Bending over – Bend over to touch toes while standing. Repeat at a comfortable pace for one minute **OR** – Jog in place for one minute if the test enclosure, such as a hood, doesn't permit bending over	X	X	
• Normal breathing – Breathe normally while standing for one minute	X	X	
• Face forward – **Premeasurement activity**: Stand and breath normally, without talking – **Measurement position**: Face forward while holding breath for 10 seconds			X
• Bending over – **Premeasurement activity**: While standing, bend over to touch toes – **Measurement position**: Hold the bending position with face parallel to the floor while holding breath for 10 seconds			X
• Head shaking – **Premeasurement activity**: Vigorously shake head from side to side for 3 seconds while shouting or making the sound of "BRRRR" loudly – **Measurement position**: Face forward, while holding breath for 10 seconds			X
• Redon-1 – **Premeasurement activity**: Remove the respirator completely and put it back on – **Measurement position**: Face forward while holding breath for 10 seconds			X
• Redon-2 – Repeat the premeasurement activity and measurement position described in Redon-1			X

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[1]The Rainbow Passage:
"When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow."
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-62010, filed 12/21/04, effective 04/02/05.]

WAC 296-307-62015 Follow procedures established for cleaning and disinfecting respirators.

You must:

- Follow the procedure in Table 20 for cleaning and disinfecting respirators.

Table 20
Respirator Cleaning Procedure

Step	Task
1.	Remove filters, cartridges, canisters, speaking diaphragms, demand and pressure valve assemblies, hoses, or any components recommended by the manufacturer. • Discard or repair any defective parts.
2.	Wash components in warm (43°C (110°F) maximum) water with a mild detergent or with a cleaner recommended by the manufacturer • A stiff bristle (not wire) brush may be used to help remove the dirt • f the detergent or cleaner doesn't contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following: – A bleach solution (concentration of 50 parts per million of chlorine). Make this by adding approximately one milliliter of laundry bleach to one liter of water at 43°C (110°F) – A solution of iodine (50 parts per million iodine). Make this in two steps: ♦ First, make a tincture of iodine by adding 6-8 grams of solid ammonium iodide and/or potassium iodide to 100 cc of 45% alcohol approximately ♦ Second, add 0.8 milliliters of the tincture to one liter of water at 43°C (110°F) to get the final solution – Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
3.	Rinse components thoroughly in clean, warm (43°C (110°F) maximum), preferably, running water. *Note*: The importance of thorough rinsing can't be overemphasized. Detergents or disinfectants that dry on facepieces could cause dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts, if not completely removed.
4.	Drain components.
5.	Air-dry components or hand dry components with a clean, lint-free cloth.
6.	Reassemble the facepiece components. • Replace filters, cartridges, and canisters, if necessary (for testing).
7.	Test the respirator to make sure all components work properly.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-62015, filed 12/21/04, effective 04/02/05.]

WAC 296-307-62020 Follow procedures established for seal checking respirators.

Important:

- User seal checks are **NOT** a substitute for fit tests. See WAC 296-307-62010 for fit test procedures.
- You may use a seal check procedure recommended by the respirator manufacturer **INSTEAD** of the procedure outlined in Table 21 if you can demonstrate the procedure is based on a scientific study that, for example, demonstrates the procedure effectively identifies respirators that fit poorly when put on or adjusted.

You must:

- Make sure employees perform a user seal check as outlined in Table 21, **EACH TIME** the respirator is worn, to make sure the seal is adequate.

Table 21

User Seal Check Procedure
Important information for employees:
• You need to conduct a seal check **each time** you put your respirator on **BEFORE** you enter the respirator use area. The purpose of a seal check is to make sure your respirator (which has been previously fit tested by your employer) is properly positioned on your face to prevent leakage during use and to detect functional problems
• The procedure below has two parts; a positive pressure check and a negative pressure check. **You must complete both parts each time**. It should only take a few seconds to perform, once you learn it
– If you can't pass both parts, your respirator is **NOT** functioning properly, see your supervisor for further instruction.
Positive pressure check:
1. Remove exhalation valve cover, if removable.
2. Cover the exhalation valve completely with the palm of your hand **WHILE** exhaling gently to inflate the facepiece slightly.
3. The respirator facepiece should remain inflated (indicating a build-up of positive pressure and no outward leakage).
• If you detect **NO** leakage, replace the exhalation valve cover (if removed), and proceed to conduct the negative pressure check
• If you detect evidence of leakage, reposition the respirator (after removing and inspecting it), and try the positive pressure check again.

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Table 21 (Continued)

Negative pressure check:
4. Completely cover the inhalation opening(s) on the cartridges or canister with the palm(s) of your hands **WHILE** inhaling gently to collapse the facepiece slightly.
• If you can't use the palm(s) of your hands to effectively cover the inhalation openings on cartridges or canisters, you may use:
– Filter seal(s) (if available)
OR
– Thin rubber gloves.
5. Once the facepiece is collapsed, hold your breath for 10 seconds **WHILE** keeping the inhalation openings covered.
6. The facepiece should remain slightly collapsed (indicating negative pressure and **NO** inward leakage).
• If you detect **NO** evidence of leakage, the tightness of the facepiece is considered adequate, the procedure is completed, and you may now use the respirator
• If you detect leakage, reposition the respirator (after removing and inspecting it) and repeat **BOTH** the positive and negative fit checks.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-62020, filed 12/21/04, effective 04/02/05.]

WAC 296-307-622 Definitions.

Air-purifying respirator (APR)
A respirator equipped with an air-purifying element such as a filter, cartridge, or canister, **OR** having a filtering facepiece, for example, a dust mask.

The element or filtering facepiece is designed to remove specific contaminants, such as particles, vapors, or gases, from air that passes through it.

Air-line respirator
An atmosphere-supplying respirator for which breathing air is drawn from a source separate from and not worn by the user, such as:

- A cylinder or a tank
- A compressor
- An uncontaminated environment.

Air supplied respirator (see air-line respirator)

Assigned protection factor (APF)
Indicates the expected level of workplace respiratory protection **WHEN** the respirator is:

- Functioning properly
  AND
- Fitted to the user
  AND

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- Worn by trained individuals
  AND
- Used with the limitations specified on the NIOSH approval label.

Atmosphere-supplying respirator
A respirator that supplies the user with breathing air from sources, such as:

- A cylinder or a tank
- A compressor
- An uncontaminated environment.

Breathing air
Air supplied to an atmosphere-supplying respirator. This air meets the specifications found in WAC 296-307-616.

Canister or cartridge (air-purifying)
Part of an air-purifying respirator that consists of a container holding materials such as fiber, treated charcoal, or a combination of the two, that removes contaminants from the air passing through the cartridge or canister.

Cartridge respirator (see also air-purifying respirator)
An air-purifying respirator equipped with one or more cartridges. These respirators have a facepiece made from silicone, rubber **OR** other plastic-like materials.

Demand respirator
An atmosphere-supplying respirator that sends breathing air to the facepiece only when suction (negative pressure) is created inside the facepiece by inhalation. Demand respirators are "**negative pressure**" respirators.

Dust mask
A name used to refer to filtering-facepiece respirators. Dust masks may or may not be NIOSH certified. See filtering facepiece.

Emergency respirator
Respirators suitable for rescue, escape, or other activities during emergency situations.

Emergency situation
Any occurrence that could **OR** does result in a significant uncontrolled release of an airborne contaminant. Causes of emergency situations include, but are not limited to, equipment failure, rupture of containers, or failure of control equipment.

End-of-service-life indicator (ESLI)
A system that warns the air-purifying respirator user that cartridges or canisters must be changed. An example of an ESLI is a dot on the respirator cartridge that changes color.

Escape-only respirator
A respirator that can only be used to exit during emergencies. Look for this use limitation on the respirator's NIOSH approval label.

Exposed, or exposure
The contact an employee has with a toxic substance, harmful physical agent, or oxygen deficient condition. Exposure can occur through various routes of entry, such as inhalation, ingestion, skin contact, or skin absorption.

Filter
Fibrous material that removes dust, spray, mist, fume, fog, smoke particles, **OR** other aerosols from the air.

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Filtering-facepiece respirator
A tight-fitting, half-facepiece, negative-pressure, particulate air-purifying respirator with the facepiece **MAINLY** composed of filter material. These respirators don't use cartridges or canisters and may have sealing surfaces composed of rubber, silicone or other plastic-like materials. They are sometimes referred to as "dust masks."

Fit factor
A number providing an estimate of fit for a particular respiratory inlet covering to a specific individual during quantitative fit testing.

Fit test (see also qualitative fit test and quantitative fit test)
Fit testing is an activity where the facepiece seal of a respirator is challenged, using a WISHA accepted procedure, to determine if the respirator provides an adequate seal.

Full-facepiece respirator
A tight-fitting respirator that covers the wearer's nose, mouth, and eyes.

Gas mask
An air-purifying respirator equipped with one or more canisters. These respirators have a facepiece made from silicone, rubber **OR** other plastic-like materials.

Half-facepiece respirator
A tight-fitting respirator that only covers the wearer's nose and mouth.

Helmet
The rigid part of a respirator that covers the wearer's head **AND** also provides head protection against impact or penetration.

High-efficiency particulate air filter (HEPA)
A powered air purifying respirator (PAPR) filter that removes at least 99.97% of monodisperse dioctyl phthalate (DOP) particles with a mean particle diameter of 0.3 micrometer from contaminated air.

Note: Filters designated, under 42 CFR Part 84, as an "N100," "R100," or "P100" provide the same filter efficiency (99.97%) as HEPA filters.

Hood
The part of a respirator that completely covers the wearer's head and neck and may also cover some or all of the shoulders and torso.

Immediately dangerous to life or health (IDLH)
An atmospheric condition that would:

- Cause an immediate threat to life
  OR
- Cause permanent or delayed adverse health effects
  OR
- Interfere with an employee's ability to escape.

Licensed healthcare professional (LHCP)
An individual whose legally permitted scope of medical practice allows him or her to provide **SOME OR ALL** of the healthcare services required for respirator users' medical evaluations.

WAC 296-307-622 (Cont.)

Loose-fitting facepiece
A respiratory inlet covering that is designed to form a partial seal with the face.

Negative-pressure respirator
Any tight-fitting respirator in which the air pressure inside the facepiece is less than the air pressure outside the respirator during inhalation.

NIOSH
The National Institute for Occupational Safety and Health. NIOSH is the federal agency that certifies respirators for occupational use.

Oxygen deficient
An atmosphere with an oxygen content below 19.5% by volume.

Permissible exposure limit (PEL)
Permissible exposure limits (PELs) are employee exposures to toxic substances or harmful agents that must not be exceeded. PELs are specified in applicable WISHA chapters.

Positive-pressure respirator
A respirator in which the air pressure inside the respiratory-inlet covering is greater than the air pressure outside the respirator.

Powered air-purifying respirators (PAPRs)
An air-purifying respirator equipped with a blower that draws ambient air through cartridges or canisters. These respirators, as a group, are **NOT** classified as positive pressure respirators and must not be used as such.

Pressure-demand respirator
A positive-pressure atmosphere-supplying respirator that sends breathing air to the respiratory inlet covering when the positive pressure is reduced inside the facepiece by inhalation or leakage.

Qualitative fit test (QLFT)
A test that determines the adequacy of respirator fit for an individual. The test relies on the employee's ability to detect a test substance. Test results are either "pass" or "fail."

Quantitative fit test (QNFT)
A test that determines the adequacy of respirator fit for an individual. The test relies on specialized equipment that performs numeric measurements of leakage into the respiratory inlet covering. Test results are used to calculate a "fit factor."

Respiratory hazard
Harmful airborne hazards and oxygen deficiency that are addressed in WAC 296-307-624, Identifying and controlling airborne hazards and oxygen deficiency.

Required use
Respirator use:

- That is necessary to protect employees from respiratory hazards
  OR
- That the employer decides to require for his or her own reasons. For example, the employer decides to follow more rigorous exposure limits
- The employer for his or her own reasons. For example, the employer decides to follow more rigorous exposure limits, or the employer is required to follow a medical recommendation.

WAC 296-307-622 (Cont.)

Respirator
A type of personal protective equipment designed to protect the wearer from harmful airborne hazards, oxygen deficiency, or both.

Respiratory inlet covering
The part of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source or both. The respiratory inlet covering may be a facepiece, helmet, hood, suit, or mouthpiece respirator with nose clamp.

Seal check
Actions conducted by the respirator user each time the respirator is put on, to determine if the respirator is properly seated on the face.

Self-contained breathing apparatus (SCBA)
An atmosphere-supplying respirator designed for the breathing air source, to be carried by the user.

Service-life
The period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer. For example, the period of time that sorbent cartridge is effective for removing a harmful substance from the air.

Sorbent
Rigid, porous material, such as charcoal, used to remove vapor or gas from the air.

Supplied-air respirator (see air-line respirator)

Tight-fitting facepiece
A respiratory inlet covering forming a complete seal with the face **OR** neck. Mouthpiece respirators aren't tight-fitting facepieces.

Voluntary use
Respirator use that is requested by the employee **AND** permitted by the employer when **NO** respiratory hazard exists.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 05-01-166 (Order 04-19), § 296-307-622, filed 12/21/04, effective 04/02/05.]

Resource Section
Respirators

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Information About Respirator Selection and Classification

Use with Chapter 296-307 WAC, Part Y-5, Respirators

This tool provides guidance about respirator selection and classification for users who aren't familiar with these topics.

When do respiratory hazards occur?

Respiratory hazards that require use of respirators can occur during:

- Routine tasks
- Tasks that occur infrequently such as monthly cleaning of a reactor vessel or chemical storage tank
- Emergencies such as rescue, response to a chemical spill, or circumstances where employees must escape from toxic atmospheres.

Am I qualified to select respirators?

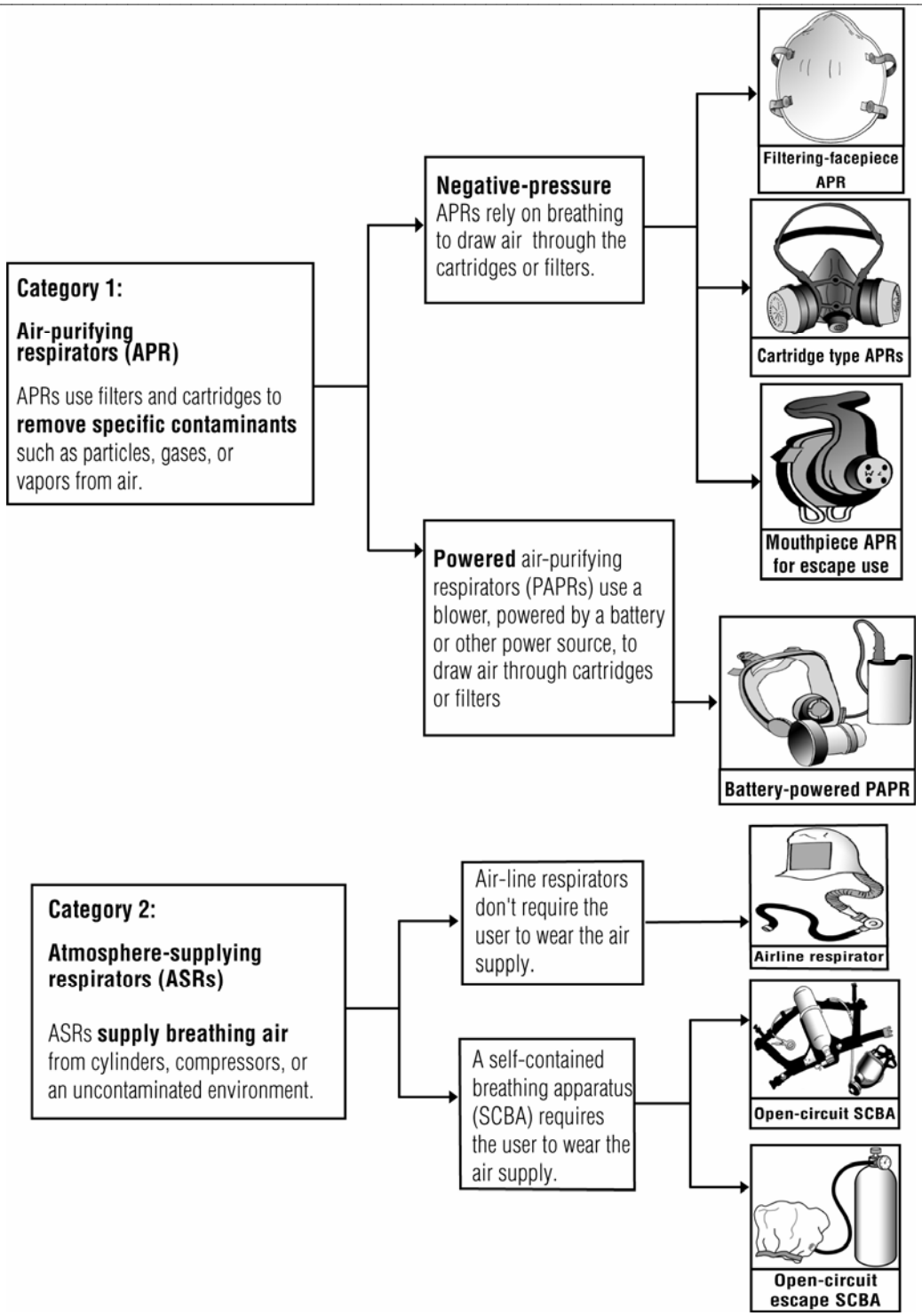
To determine this, you'll need to consider:

- The complexity of your employees' exposures to respiratory hazards and respirator use circumstances.
- If you have a suitable level of technical knowledge and experience with respirators to address respiratory hazards and use circumstances.

  For example, individuals selecting respirators solely for wood dust exposure wouldn't need as high a level of knowledge and experience as individuals selecting respirators for multiple contaminants or for highly hazardous circumstances such as emergencies.

What types of respirators are available?

All respirator types can be sorted into 2 main categories as shown. Some respirator models that combine features from both categories are also available, but aren't shown here.


Category 1:
Air-purifying respirators (APR)
APRs use filters and cartridges to remove specific contaminants such as particles, gases, or vapors from air.
Negative-pressure
APRs rely on breathing to draw air through the cartridges or filters.
Powered air-purifying respirators (PAPRs) use a blower, powered by a battery or other power source, to draw air through cartridges or filters
Filtering-facepiece APR
Cartridge type APRs
Mouthpiece APR for escape use
Battery-powered PAPR
Category 2:
Atmosphere-supplying respirators (ASRs)
ASRs supply breathing air from cylinders, compressors, or an uncontaminated environment.
Air-line respirators don't require the user to wear the air supply.
A self-contained breathing apparatus (SCBA) requires the user to wear the air supply.
Airline respirator
Open-circuit SCBA
Open-circuit escape SCBA

Where can I find more information about respirators and selection?

Resources include:

- OSHA's Respiratory Protection Advisor – Visit www.osha.gov.
- NIOSH's 1987 Decision Logic – Visit www.cdc.gov/niosh.
- The Center for Disease Control and Prevention (CDC) – Visit www.cdc.gov to find information on biological agents such as TB, hanta virus, psittacosis and anthrax.
- Respirator manufacturers' on-line selection guides and other information – Visit www.lni.wa.gov/wisha and select the Respiratory Protection topic page to find a list of respirator manufacturers and website links.
- The American National Standard for Respiratory Protection, ANSI Z88.2-1992, or most recent edition – Visit www.ansi.org to find out how to obtain a copy or contact your local librarian for access.
- WISHA. Visit www.lni.wa.gov/wisha/consultation for a list of WISHA consultants available for assistance.
- Experienced respirator distributors, and private industrial hygiene consulting services listed in your local phone book.

Key Information About NIOSH Certified Respirators
Use with Chapter 296-307 WAC, Part Y-5, Respirators

This tool will help you understand how to find and use NIOSH certification information.

Why is NIOSH certification important?

NIOSH certified respirators are rigorously checked and tested to make sure they can perform well and are suitable for workplace use. These assurances don't extend to respirators that aren't NIOSH certified.

How do I know if a respirator has been NIOSH certified?

You can't always tell by examining the respirator. If it's NIOSH certified, it'll have an approval label somewhere on the product box or on printed materials contained in the box.

The label will include "TC" numbers along with important caution and limitation information about the respirator's use.

How do I use TC numbers?

These numbers help you know which parts are acceptable to use on each respirator assembly.

When making repairs, make sure replacement parts used are listed under the TC number for the assembly chosen, otherwise, you will create a non-certified respirator assembly.

Each respirator assembly has one TC number. If more than one TC number is listed on the approval label, this means more than one NIOSH-certified assembly is available.

Does NIOSH certification expire?

No. However, NIOSH certification is voided when:

- Users don't follow the approval label's use specifications, including listed cautions and limitations
- Respirator parts used aren't listed under the respirator assembly's TC number

NIOSH occasionally withdraws certification for a respirator assembly. When this happens, a user notice is posted on their website at www.cdc.gov/niosh/respnotices.html

What are N, R, and P series respirators?

N, R, and P are NIOSH certification categories that apply to negative-pressure air-purifying respirators that protect against hazardous particles. They do **not** apply to powered air purifying respirators (PAPRs).

N, R, and P respirators are also called particulate respirators because they use filter material to protect users from airborne dusts, sprays, mists, fumes, and other solid or liquid particle contaminants.

What do the designations N, R, and P mean?

These designations refer to the use restrictions for respirator categories shown in **Table HT-1**.

Table HT-1
Use Restrictions for N, R, and P Respirator Categories

Use	When
N	No oil is present in the air
R	Oil is present, but only for a single shift or 8 hours of continuous or intermittent use. **Note:** Reuse beyond a single shift or 8 hours is NOT recommended.
P	Oil is present, but follow the manufacturer's time use limitations if you want to reuse these.

For more information about limitations and capabilities of these respirators, see the May 2, 1997 NIOSH Respirator User's Notice, "Letter to All Users of P-Series Particulate Respirators" or visit: http://www.cdc.gov/niosh.

What do the designations 100, 99, and 95 mean?

Table HT-2 shows how efficient the respirator's filter capability is expected to be against particles that are at least 0.3 micrometers. The higher the number, the higher the efficiency expected.

Table HT-2
Efficiency Levels for N, R, and P Respirators

If the efficiency level is	This means
100	The filter is expected to trap 99.97 particles out of every 100. It is as efficient as a High Efficiency Particulate Air (HEPA) filter.
99	The filter is expected to trap 99 particles out of every 100
95	The filter will trap 95 particles out of every 100. Note: For many exposure situations, this level is adequate

Can I still use particulate respirators certified for "dust" or "dust, fumes and mists"?

These air-purifying particle-removing respirators are no longer easy to find. They were certified under NIOSH's former standard, 30 CFR Part 11, replaced by 42 CFR Part 84, and can no longer be sold for occupational use.

Also, due to less stringent testing of these respirators, you can only use them when you can prove the particulate contaminants involved are 2 micrometers or **larger** in size.

If you have particle contaminants that are **smaller** than 2 micrometers, you'll need to use an N, R, or P series respirator instead.

Where can I find NIOSH certification requirements?

NIOSH certification requirements are in the federal regulation, Title 42 CFR, Part 84, Respiratory Protective Devices. This regulation replaced 30 CFR Part 11 in 1995. You can find this standard, in its entirety by visiting: http://www.access.gpo.gov/nara/cfr/index.html

Planning for Medical Evaluations
Use with Chapter 296-307 WAC, Part Y-5, Respirators

This information can help you prepare for employee medical evaluations required by Chapter 296-307 WAC, Part Y-5, Respirators. This information doesn't apply to medical evaluation requirements found in other WISHA rules.

Who is allowed to perform medical evaluations?

Only licensed health care professionals (LHCPs) are allowed to perform these evaluations. You may use:

- On-site medical staff
  or
- Medical staff from outside services

In Washington state LHCPs include:

- Physicians
- Physician Assistants (PAs)
- Advanced Registered Nurse Practitioners (ARNPs)
- Registered Nurses

What medical questionnaire is required?

Use **any** of the following:

- The WISHA Medical Evaluation Questionnaire provided in WAC 296-307-620, Required Procedures for Respiratory Protection Program.
- The OSHA Respirator Medical Evaluation Questionnaire found in Appendix C of 29 Code of Federal Regulations (CFR), Part 1910.134, Respiratory Protection.
- Questionnaires developed by other parties, such as on-line services, if these questionnaires include the same questions found in Parts 1-3 of the WISHA Medical Evaluation Questionnaire.
  - A LHCP may add questions or change the order of required questions.
  - In some cases, questions added by the LHCP before administering the questionnaire can minimize the need for LHCP follow-up.

-Continued-

Is there an alternative to using a questionnaire for employee evaluations?

Yes. You can choose to have medical exams conducted instead of using the questionnaire, as long as you make sure the exam obtains the same information as found in the questionnaire.

Why is confidentiality important?

Aside from legal considerations, confidentiality encourages employees to provide complete and correct health information for the LHCP's evaluation. This helps make sure reliable medical evaluations are provided.

How do I maintain confidentiality during questionnaire administration?

Here are some strategies to consider when planning for evaluations:

- Make arrangements to have a LHCP administer the questionnaire at the workplace.
- Allow the employee to self-administer the questionnaire and mail it, postage paid, to the LHCP.
  - Since employees may have questions about medical issues, arrange for an LHCP to be available by telephone or e-mail during the time the questionnaire is being administered.
- If you decide to have an individual administer the questionnaire who isn't a LHCP:
  - Instruct the individual **NOT** to look at the employee's questionnaire at any time
  - Provide pre-addressed, stamped envelopes for completed questionnaires
  - Instruct employees to place their completed questionnaires in the envelope, seal it, and mail or forward it to the LHCP
- Have the employee use an on-line questionnaire service that meets the requirements in WAC 296-307-60405, Provide Medical Evaluations.

-Continued-

What if my employee can't read the questionnaire?

Find out if language translation services are needed, or if employees need help with reading.

- If language translation services are needed you can use:
  - An interpreter. It's not necessary to provide a professional interpreter. Interpreters can be an individual trusted by the employee such as a co-worker, friend, family member, or the LHCP.
  - A translated version of the questionnaire when available. For a Spanish-language version visit http://www.lni.wa.gov/WISHA
  - If reading assistance is needed, make arrangements ahead of time to use an individual trusted by the employee to assist them while filling out the questionnaire.
- While making these arrangements remember to address any possible confidentiality issues that could arise.

Using Assigned Protection Factors (APFs) for Respirator Selection

Use with Chapter 296-307 WAC, Part Y-5, Respirators

Important!

Use this tool if you need help using the APFs in Table 5 of Chapter 296-307 WAC, Part Y-5, Respirators.

- This tool is designed to compare hazard ratios (these are values that rate the level of employee protection needed) to APFs (these are values that rate the expected level of protection provided by different types of respirators under ideal conditions) to determine which respirator types are acceptable pending further selection criteria in Chapter 296-307 WAC, Part Y-5, Respirators.

If exposure circumstances in your workplace aren't addressed by this tool, contact your local WISHA consultant. See www.lni.wa.gov/wisha/consultation for a list of consultants to assist you.

Step 1: Make sure you start by having this information available:

- Estimated or measured employee exposure concentration values for each respiratory hazard identified during your exposure evaluation.

Reference:
See Chapter 296-307 WAC, Part Y-6, Respiratory Hazards, if you haven't completed an exposure evaluation.

- WISHA's permissible exposure limit (PEL) value.
  - There are 3 types of PEL values:
    - 8-hour, time-weighted (TWA_8) value
    - Short-term exposure limit (STEL) value
    - Ceiling (C) limit value
  - You only need the PEL values that exposure evaluation results show are exceeded. For example, if employee exposure concentrations exceed the TWA_8, but **not** the STEL or Ceiling limit, you will only need the TWA_8 value.

Step 2: Calculate hazard ratio values for **each** substance using this formula:

$$\text{Hazard ratio} = \frac{\textit{Concentration} \text{ in ppm (or mg/ } M^3)}{\textit{PEL} \text{ in ppm (or mg/ } M^3)}$$

- Use **Table HT-1** to define the terms in the formula.

Table HT-1 **Key to Formula symbols**	
The term	**Is the**
Concentration	Estimated or measured concentration of the respiratory hazard during an 8-hour or a short-term exposure period, determined during your hazard evaluation.
PEL	WISHA Permissible Exposure Limit (PEL) established for the substance.
ppm	Concentration units in parts per million
mg/ M^3	Concentration units in milligrams per cubic meter
*Concentration units (ppm or mg/M^3) used in the formula for "Concentration" and "PEL" must be the same. If they are different, contact your local WISHA consultant or your laboratory to get help with converting your "Concentration" value.	

- Calculate the hazard ratio, using the formula, for 8-hour exposure periods when exposures exceed the WISHA TWA_8 value.

- Calculate the hazard ratio, using the formula, for short-term exposure periods when exposures exceed the WISHA STEL value.

- If you are uncertain about this step, review this example:

Example 1:

Your employees are exposed to a **single** airborne substance. Calculate hazard ratios based on the information in **Table HT-2.**

Table HT-2

Example 1: Exposure Evaluation Information

- WISHA's PELs for the substance are:
  - 50 mg/M^3 = TWA_8
  - 150 mg/M^3 = STEL
- Your hazard evaluation results show employees are exposed to the substance at concentrations above WISHA's TWA_8 and STEL. These results are reported as:
  - 300 mg/M^3 averaged over an 8-hour exposure period
  - 600 mg/M^3 averaged over a 15-minute (short-term) exposure period

You will need to calculate 2 hazard ratio values since evaluation results show employees are exposed above WISHA's TWA_8 and STEL.

Put the **8-hour** values for "PEL" and "Concentration" into the formula and calculate the hazard ratio

$$\frac{Concentration}{PEL} = \frac{300mg/M^3}{50mg/M^3} =$$

A hazard ratio of 6 for the 8-hour exposure period

Put the **short-term** values for "PEL" and "Concentration" into the formula and calculate the hazard ratio

$$\frac{Concentration}{PEL} = \frac{600mg/M^3}{150mg/M^3} =$$

A hazard ratio of 4 for the short-term exposure period

Step 3: If the respiratory hazard is a **single** substance, select the highest hazard ratio value and skip to Step 6.

If the respiratory hazard is a **mixture** of substances, you'll need to determine if substances in the mixture have additive health effects. After this determination, go to Step 4.

Reference:

If you haven't evaluated the substances to find out if they have additive health effects, follow the guidance in Steps 1 & 2 of the **Mixtures of Substances** Helpful tool, located in the Resources section of this part.

Step 4: If substances in the mixture do **not** have additive health effects, select the highest hazard ratio value and skip to Step 6.

Step 5: When substances in the mixture have additive health effects, add up the hazard ratio values of exposure periods to get a total value for each exposure period. Select the highest hazard ratio total.

Example 2:

- Employees are exposed to a mixture of 2 substances with additive health effects. Select the highest hazard ratio total.
- Hazard ratios for each substance and totals for each exposure are shown in **Table HT-3.**
- The highest ratio total is 15.

Table HT-3
Example 2: Hazard Ratios and Totals

Identity of the substance	Hazard Ratios for the 8- hour exposure period	Hazard ratios for the short-term exposure period
Substance 1	10	4
Substance 2	5	1
	Total = 15	**Total = 5**

Step 6: Compare your hazard ratio value to the APF values in Table 5 of Chapter 296-307 WAC, Part Y-5, Respirators.

AND

Note any respirator types in Table 5 with an APF **equal or more than** your hazard ratio.

- These respirator types are capable of providing a sufficient protection level for your workplace exposure concentrations; **however**, other selection requirements found in WAC 296-307-60205, Select and Provide Appropriate Respirators, must be followed to determine your final respirator selection outcome.

Example 3:

- A hazard ratio of 3 has been determined.
- Which respirator types are acceptable for further selection consideration?
  - All APFs shown in Table 5 of Chapter 296-307 WAC, Part Y-5, Respirators, have an APF that's more than 3, so all types of respirators are acceptable for further selection consideration.

Example 4:

- A hazard ratio of 12 has been determined.
- Which respirator types are acceptable for further selection consideration?
  - Respirator types shown in Table 5 of Chapter 296-307, Part Y-5, Respirators, with an APF of 25 or more, are acceptable for further selection consideration. In this case, all other respirators must be excluded from your selection process.